The Chemical Age

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Notes and Comments

Imperial Chemical Report

THE report and accounts to be presented at the annual meeting of Imperial Chemical Industries, Ltd., on Thursday next shows that the company's business has withstood the depression remarkably well, and that during the past few months there have been encouraging signs of a revival in home demand. Apart from a moderate advantage gained by the fall in sterling, the wide spread of the company's activities has exposed it fairly fully to the effects of the slump. Nevertheless, in most of the departments reviewed by the directors the falling off has been only moderate; in some, such as dyestuffs and lime, there was actually an increase. Fertilisers are still unsatisfactory, but the allied products of the fertiliser group are developing well. The general conclusion is that the company has done well, and that its business is very much more stable than was supposed at the beginning of the depression. The liquid position is good, and as the main development programme was completed in 1930, it may be supposed that the company will not require further funds for a while. A revival in trade will re-absorb cash into the general business, but, to begin with, it will probably not take much more than was released from the business during last year. If the company continues to produce accounts as good as these it will soon establish itself in the confidence of serious investors.

The fall in the company's gross revenue before providing for the central obsolescence fund was due almost entirely to dividends from subsidiary and associated companies falling from £4,670,162 to £4,208,029. Before arriving at the profits out of which the subsidiaries' dividends are declared, some £1,750,000 has been charged for maintenance expenditure, and £300,000 has been charged for depreciation. Besides normal current depreciation, the directors have decided that £1,837,596 worth of plant has been rendered redundant in the course of general reorganisation. This has been met by a two-stage transfer. First £1,500,000 is transferred from general reserve to the central obsolescene fund; then £1,337,596 is allocated from that fund to write down the value of advances to subsidiaries. The balance of £500,000 required for the writing down is provided by a direct transfer from general reserve. The net result on the company's reserves is to raise the central obsolescenc fund from £4,500,000 to £5,662,404, and to diminish the general and free reserves from £12,725,000 to £10,725,000. Besides the depreciation of plant there is a depreciation of £3,346,565 (against £2,723,365) on the marketable and other investments.

Increase in Issued Capital

ISSUED capital was increased by £426,000 to £77,098,000, the increase being largely connected with the purchase of additional interests in subsidiary companies and the acquisition of the British Alizarine Co. The company's investment holdings are nearly £3,000,000 larger at a total of £73,328,000; nearly the whole of this increase has taken place in holdings of subsidiary companies—namely, those in which an interest of more than 50 per cent. is held. Including advances to such companies, the book value of the holding in subsidiary companies amounted on December 31 last to £71,102,000. The board has written £1,837,000 off this sum. Such amount is represented not only in the closing down of works which have become redundant for one reason or another, but by the money spent on developments, which either show

no prospect or a very distant prospect of becoming profitable.

The book value of the company's marketable and other investments on December 31 last was £9,540,000, to which may be added the investments of the subsidiary companies, which raise the total to £10,183,000. Owing to the general further fall which has taken place in share and security values, the market value, or computed value in the case of unquoted investments, was £3,346,000 less than the book value. On this matter the directors point to present day Stock Exchange quotations as abnormal and state that until the general situation is clearer and a more stable level of prices evident it would be premature to make any revaluation of these investments. Meanwhile the depreciation is amply covered by the reserve, which stands at £10,725,000, in spite of the transfer made to the central obsolescence fund. The balance-sheet again shows a substantial surplus of floating assets over current liabilities. Investments, debtors, and cash appear in the accounts at a total of £23,123,000, against which the sum due to creditors, including the amount required for the current dividend, is £5,480,000.

Reason or Unreason

IT is Goethe year and, the world over, thoughtful men and women are considering the influence of his writings and his activities. For Goethe, like Shakespeare, had the faculty of expressing great truths in simple phrases: a man of action he was both content and determined to learn from life. He was a man of science too and if he had not been so great a poet we might have honoured him for that reason. His centenary coincides with troubled times, a multitude of new problems face us, so many indeed that on grey days they seem likely to overwhelm us and we fear for a state of chaos. Coming after a period of prosperity and well being, of ease and extravagance, of mass production and rationalisation the economic worries find us ill prepared for privation, and the peoples of the world resent having to accept sterner conditions of existence after having been assured by the politicians that the millenium was at hand. With such thoughts in mind we are tempted to quote some lines from Faust which Goethe puts in the mouth of Mephistopheles addressing " der Herr ":

" Ein Wenig besser wärd er leben
Hättst du ihm nicht den Schein de Himmelslichts gegeben
Er neuts vernunft und braucht's allein
Nur tierischer als jedes Tier zu sein."

Technical men, engineers and chemists in particular, have not escaped from the criticism that their efforts have contributed greatly to the excessive production which is at least one cause of the economic downfall, and one of the suggested remedies has been a close time for us for a period of years, during which there are to be no new inventions, and no cheapening of processes. Such a solution is obviously an impossibility; one cannot arrest the tide of progress any more than Canute, according to tradition, was able to stop the waves. Yet the facts are well enough known. One man to-day can do the work for which several were required in 1900, in practically every productive industry. In the craft industries the individual worker has been replaced by the machine in a mass production factory, as some think to the detriment of the product, or as Goethe expressed it " If a man has freedom to live healthily and to work at his craft, it is enough." In the chemical industry things are somewhat different. Here the greater output per man is due to scientific control leading to larger yields, to new or improved processes, to improved handling of greater quantities resulting from the advance of chemical engineering. Where progress might be termed " unreasoning " is exemplified in the desire of each nation to erect competitive plants employing the same or rival processes to make a particular chemical without having regard to the ultimate market for it. It is a fault which one had hardly expected to be committed by a scientific industry, an error which apparently has largely arisen out of blind faith in the ability of the modern salesman to increase his markets provided he could lower his price. Sales talk has been an insidious disease originating in the west and able to cross the Atlantic; as a disease it is as infectious as influenza and as recurrent. It is time to face facts; to realise and to agree that competition is unreasoning and that capital spent on new plants and processes ahead of a potential market will not only cause the capital in the plants which it replaces to vanish, but may itself have so short a period of life that the cost of depreciating it will make the real cost of the product produced in the new plant far in excess of what it was in the old plant. Never has capital vanished at the rate it is now doing; never did it appreciate so rapidly as during the recent boom period. How true are Goethe's lines when applied to industry to-day. And yet we talk of over-production when more than half the world is near to starvation, when it could use these commodities and more had it only the work to provide the money to buy them. With Shakespeare we can say, " 'Tis a mad world, my masters."

The Calendar

April 11.—Institution of the Rubber Industry. " Moulds and the Moulding of Miscellaneous Rubber Goods." H. Rogers. " Presses and Control Gear for the Rapid Moulding of Miscellaneous Rubber Goods." F. Siddall. 7.30 p.m. First Avenue Hotel, London.

April 11.—London " Safety First " Council (Industrial Section). " Non-Machinery Accidents." Leonard Ward. 7 p.m. Institution of Mechanical Engineers, London.

April 12.—Institution of Petroleum Technologists. "Symposium on Spontaneous Ignition Temperature." L. J. Le Mesurier, J.L. Chaloner and F. A. Foord. 5.30 p.m. Royal Society of Arts, London.

April 12.—Hull Chemical and Engineering Society. General meeting. 7.45 p.m. Grey Street, Park Street, Hull.

April 13.—Institute of Chemistry (Belfast Section). Visit to Ormeau Bakery at 3.30 p.m.

April 13.—Institute of Fuel. Annual general meeting of members, 6 p.m., followed by paper entitled " Evaluation of Coal from the Users' Standpoint," by Dr. E. S. Grumell. Burlington House, Piccadilly, London.

April 14.—Optical Society. 7.30 p.m. Imperial College of Science and Technology, South Kensington, London.

April 14.—Oil and Colour Chemists' Association (London Section). " Some Contradictory Views on Paint Consistency." D. H. S. Forbes. 7.30 p.m. 30 Russell Square, London.

April 15.—Society of Dyers and Colourists (Manchester Section). Annual meeting. Short papers by members. 7 p.m. 36 George Street, Manchester.

April 15.—Electroplaters' and Depositors' Technical Society. Symposium on " Metal Cleaning." E. H. Dobbs, Dudley Weill, S. Wernick. 8.15 p.m. Northampton Polytechnic Institute, Clerkenwell, London.

Books Received

HONEST DOUBT, OR THE PRICE OF POLITICS. By Sir Ernest J. P. Benn. London: Ernest Benn, Ltd. Pp. 248. 6s.

ANNUAL REPORTS ON THE PROGRESS OF CHEMISTRY. Vol. xxviii, 1931. The Chemical Society. Pp. 442. London: The Chemical Society 10s. 6d. (postage 6d. extra).

Modern Methods for Extraction of Tanning Material

Advantages of the "Buss" System

In a paper presented before the recent Basle Conference of the International Society of Leather Trades Chemists, Dr. Tottoli (*Cuir Tech.*, 1932, p 95) said that present day conditions in the tanning and dyeing extract industry demanded the most rigid economy in the production of such extracts. In an up-to-date plant, the maximum of production from each extraction battery, coupled with the maximum yield of final extract were expected, together with a high degree of quality. Liquors should be of a high strength so as to result in a maximum economy of steam, and, therefore, in both fuel and water.

Present day processes were not capable of complying with these conditions, some being favourable in certain aspects only and some in others. Taking the ordinary method of extraction, a battery is so arranged that water enters the extractor at the tail of the battery containing almost exhausted material. This weak liquor is then worked up to the head of the battery to the final extractor which contains practically new material. From this head extractor the liquor passes to the evaporator. In working this system certain pressure is used to overcome the resistance offered by the raw material and the clogging of the false bottom in the extractor.

It is not uncommon to have to stop the extractor in the series in order to dismantle it and clean out the false bottom. This is particularly frequent when extracting quebracho wood. The process also has another disadvantage, in that when the weak liquor is being worked through the battery it dilutes down some of the more concentrated liquor in the succeeding extractor; this results in an increase in the volume of final liquor to be concentrated. These disadvantages are said by the author to be overcome by use of what is termed the "Buss" system. This process appears to have two main characteristics. The first is the method of transference of the liquor from one extractor to another without any dilution, and the second is the method of keeping the contents of each extractor in slight motion. Diagrammatic representation of the plant is shown in the accompanying figure.

A Graduated Counter-Current Principle

The liquors are put into gyratory movement by means of a pump attached to each extractor and attached to lead elements inside the vessel. The motion thus induced hastens the diffusion of the soluble matter by constantly renewing the solvent round each particle of the bark of wood, while the latter is constantly kept from the false bottom, thus avoiding clogging with its attendant inconvenience. In the transference of the liquor from one extractor to another, use is made of one common pump. For example, the concentrated liquor coming from the fresh wood is completely removed by pumping; the liquor from the preceding extractor is then pumped over. This avoids any mixing of weaker with stronger liquors. The principle of the method is really a graduated counter-current system, in which the maximum concentration of liquor is aimed at by reducing the proportion of liquor necessary for efficient extraction to a minimum. In this system, the relationship of the extracted liquor from chestnut wood sent to the evaporator is 1.8, compared with the waste spent wood, as against 3 to 3.5 in the old pressure method. The process has yet another very distinct advantage, and that is the temperature of each extractor can be regulated and maintained at any desired point most favourable for the material being extracted, either by means of the heating coils under the false bottoms, or by the calorifiers shown in the diagram. The rapid passage over the heating surface, and the quick circulation through the material avoids any local over-heating or destruction of substance readily decomposed by heat.

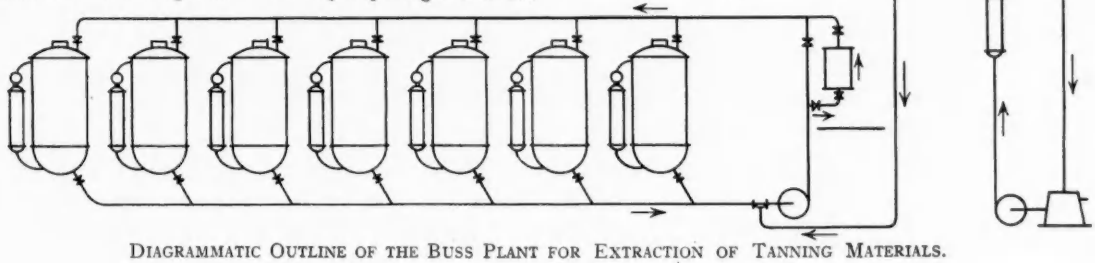
Increased Extraction Capacity

The battery of extractors, seven in number, each having a capacity of 5,500 litres, is capable of extracting 41-43,000 kilos of chestnut wood in 24 charges per 24 hours. With a tannin content of 7 to 8 per cent. for a wood of 40 per cent. moisture content, liquors of 3.2° to 3.5° Bé are obtained, ready to send to the evaporators, while by the old pressure leach system liquors of 1.8 to 2.2 Bé only are produced, and to extract the same quantity of wood in 24 hours by the old system would necessitate extractors of such larger dimensions. The tannin in the spent bark amounts to about 0.5 to 0.8 per cent for a moisture content of 50 per cent. This method undoubtedly gives a maximum yield of extract with a minimum loss of tannin, and to obtain similar yield by the old process a much larger volume of water would be required and hence a greater steam consumption for evaporation.

A plant of the above capacity gives 7,500 litres of 3.2 to 3.5° Bé liquor for 42 tons of chestnut wood, instead of about 126,500 litres of 2° Bé liquor by the old method. Assuming that this liquor is evaporated to 25° Bé in a double-effect evaporator, the difference in the water to be evaporated represents an economy of 41 per cent. in steam, and the net economy in both extraction and evaporation amounts to 70 per cent. as compared with the old method. There is, in the first place, about 51,500 litres of water less to be reheated (say from 40° to 90° C.) which corresponds to an economy of about 4,760 litres of steam. Secondly, there are 51,500 litres of water less to evaporate, which, on the basis of a consumption of 70 per cent. of steam in a double effect, is about 36,240 kilos of steam, making a total saving of 41,000 kilos of steam in 24 hours. This represents a saving of about 6 tons. The high concentration of the liquor sent to the evaporator allows the use of a smaller plant, while the economy in water is also a point in those places where it is scarce, or where very hard waters only are available and which require softening prior to use. When the material to be extracted is very rich in tannin, such as gall nuts (which contain about 65 per cent. tannin), this new system enables liquors of 10°-12° Bé to be obtained, against those of 5° Bé by the old method, which represents an increase in production of 30-40 per cent. with plant of similar capacity.

British Drug Houses, Ltd.

Trading profits of £36,381, against £58,086, are returned by the British Drug Houses, Ltd., whilst net earnings, after tax, depreciation and amortisation, are £17,049, as against £40,002 last year. It is explained in the directors' report that the reduction is due largely to the bad trade during the period, accompanied by a further fall in values. Home trade maintained its turnover, but was subjected to severe competition. The export trade suffered appreciably in the world depression, recovering slightly at the close of the year. The first two months of 1932 show a marked improvement on the corresponding months of 1931. Nothing is being paid this year on the Ordinary shares, as compared with 5 per cent. for 1930.

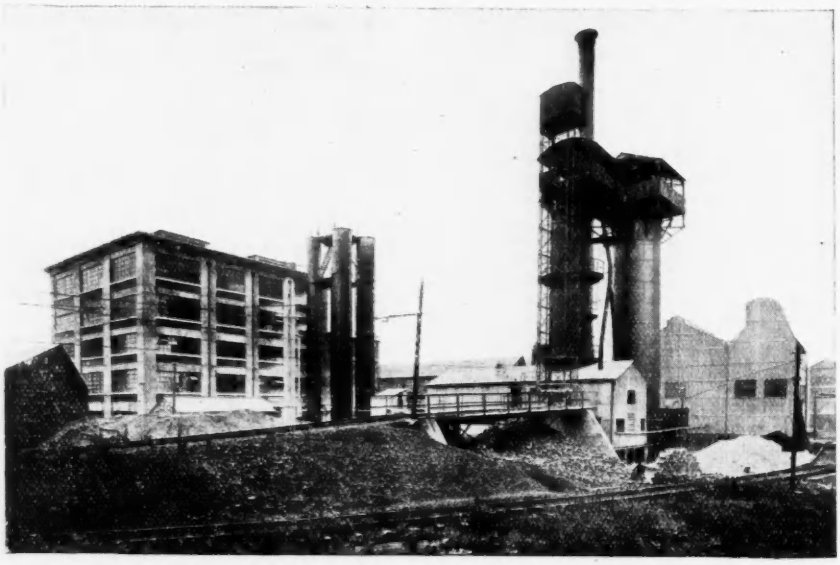


Diagrammatic Outline of the Buss Plant for Extraction of Tanning Materials.

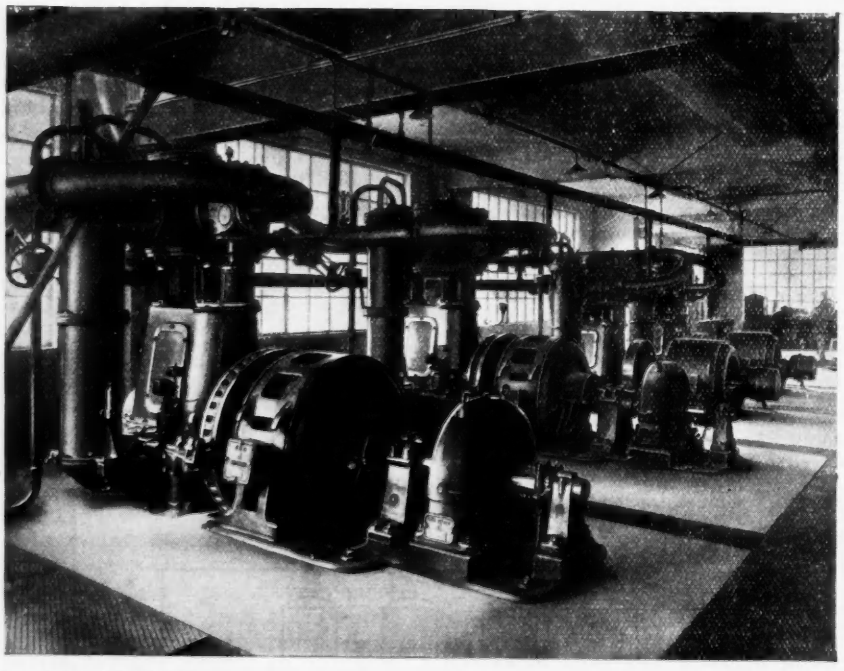
An Up-to-Date Chemical Works at Darlington

The Electrical Equipment

THE output of the factories of the Chemical and Insulating Co., Ltd., at Darlington, which has recently been erected and equipped in accordance with the most modern practice for production on a large scale, covers a wide scope, and includes 85 per cent. magnesia coverings as used for steam pipes, boilers, and the insulation of any heated surfaces, also high temperature coverings, now essential for power stations in industrial undertakings where temperatures exceeding 600° C. are dealt with. The company manufactures, in addition, the Darlington "Dextramite" high temperature covering which will withstand temperatures up to 1,600° C., and a "Dextramite" insulating brick, which is largely used by furnace builders and iron and steel companies for the insulation of blast furnaces, coke ovens and similar plant.

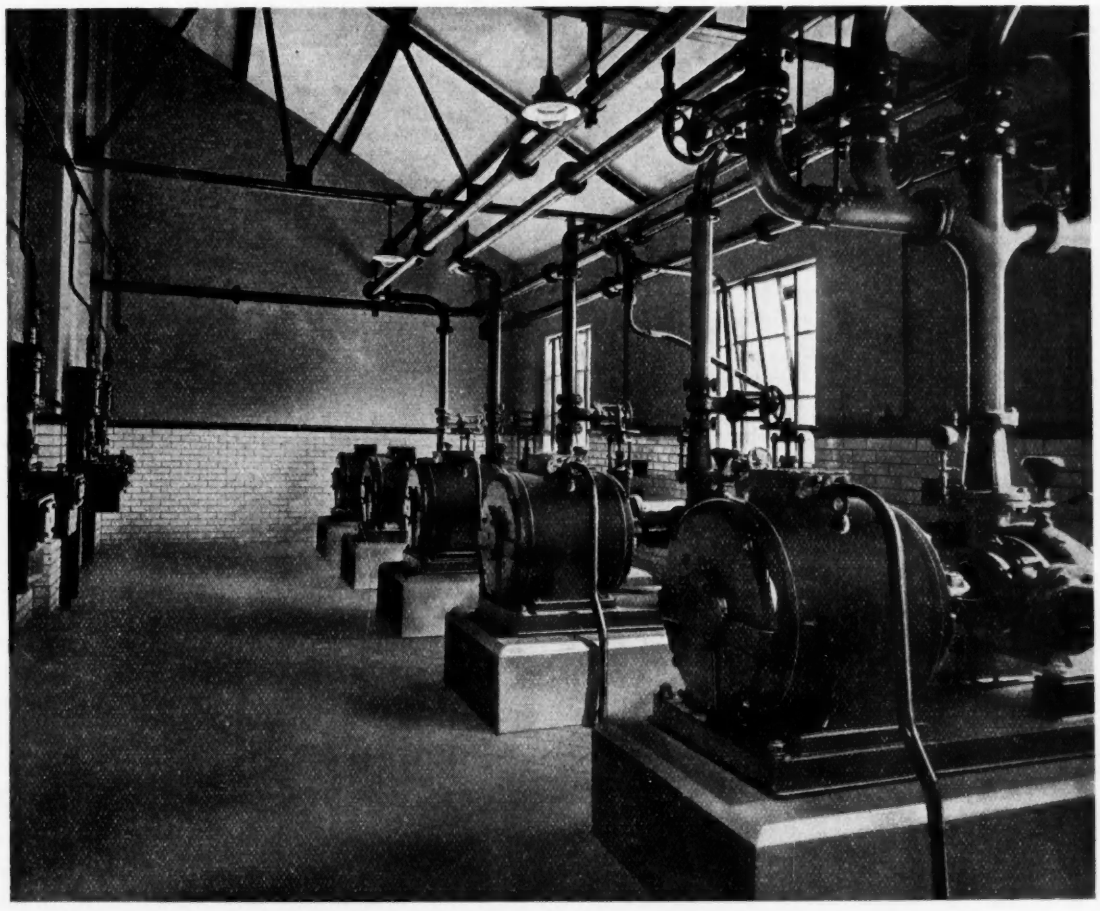


GENERAL VIEW OF WORKS OF THE CHEMICAL AND INSULATING CO., LTD., DARLINGTON.

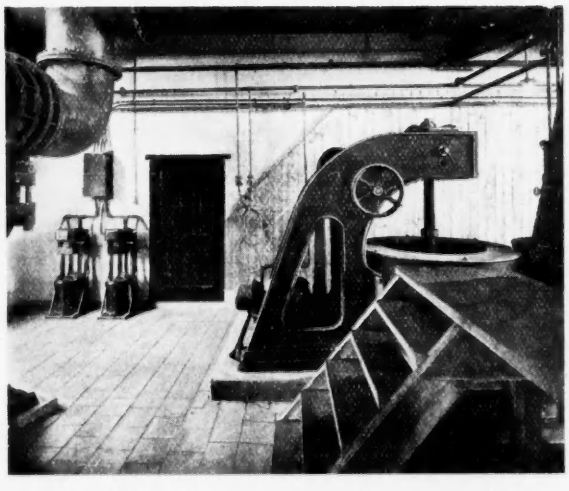


COMPRESSOR EQUIPMENT, SHOWING TWO 105 H.P. "WITTON" SYNCHRONOUS INDUCTION MOTORS FOR AIR COMPRESSORS AND TWO 70 H.P. "WITTON" SLIP-RING MOTORS FOR GAS COMPRESSORS.

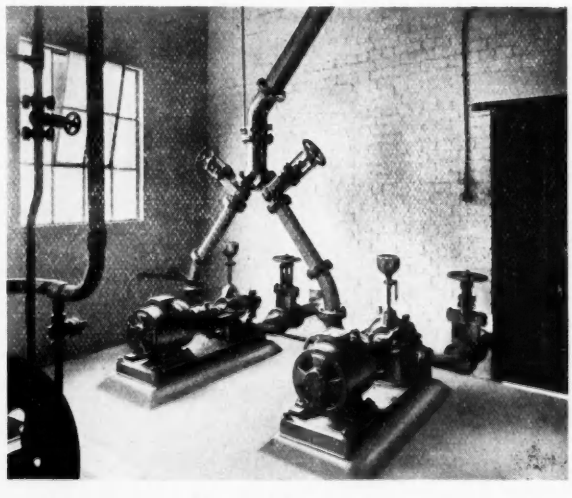
Another range of manufactures undertaken in the works is the production of carbonate of magnesia and calcined mag-



FIVE 16 H.P. TOTALLY ENCLOSED "WITTON" MOTORS INSTALLED IN THE BENZOL HOUSE; THESE MOTORS ARE PROVIDED WITH SPECIAL CONTROL GEAR FOR BUILDINGS IN WHICH EXPLOSIVES MAY BE PRESENT.



10 H.P. "WITTON" MOTOR DRIVING CENTRIFUGAL HYDRO-EXTRACTORS WITH G.E.C. MOTOR CONTROL PILLARS IN BACKGROUND.



TWO 5 H.P. "WITTON" MOTORS DIRECTLY COUPLED TO LIME MIXERS. (SULPHATE PLANT.)

Electrical Equipment at an Up-to-date Chemical Works.

These photographs, reproduced by courtesy of The General Electric Co., Ltd., were taken at the works of the South Yorkshire Chemical Co., Parkgate, near Rotherham.

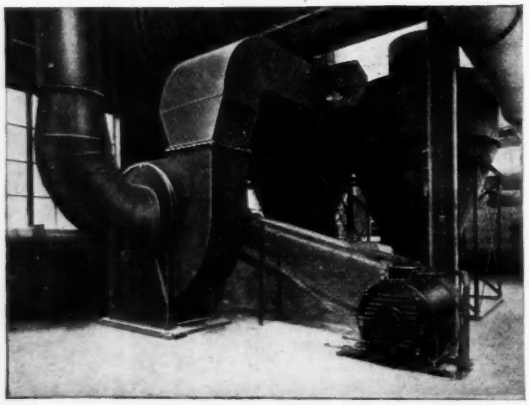
nesia for pharmaceutical and industrial purposes, large quantities of which are sent to rubber and tyre manufacturers, who make considerable use of both these materials. In the preparation of the material a number of processes are involved such as burning, crushing, hydrating, pumping, drying, etc.; supplies of compressed air and gas are also required. At later stages of production machinery is required for finishing processes.

For operating the plant and machinery installed, extensive use is made of electric power, and an important part of the contract for the electrification scheme was placed with the General Electric Co., Ltd. The plant and apparatus supplied under this contract included main and auxiliary switchboards, motors and motor control gear, and the electrical equipment for an electric locomotive for yard shunting purposes. The whole of this equipment was manufactured at the company's Witton Engineering Works, Birmingham.

The power supply is taken from the Darlington Corporation 6,000 volt mains and transformed to 400 volts. Distribution to the works is controlled by a G.E.C. switchboard consisting of six slate panels, of which four control power feeder circuits, one controls lighting feeder circuits, while on the remaining panel is mounted a power factor meter. Each of the feeder circuits is equipped with a three-phase oil circuit-breaker with overload trips, isolating links, ammeter, etc. There are a large number of electric motors installed for driving the various appliances, the most important of which are those coupled to the air compressors, gas compressors, and drying fans.

The air compressor equipment comprises two Bellis and Morcom two-crank two-stage units, each capable of compressing 625 c.ft. of free air per minute, delivery being at 60 lb. per sq. in. Each compressor is driven by a 105 h.p. Witton synchronous induction motor, 440 volts, 3-phase, 50 cycles, 333 r.p.m., operating at 0.9 leading power factor. The motors are operated by liquid starters controlled from two steel plate cubicles equipped with oil circuit-breakers with two overload trips and no-volt coil, and a moving iron ammeter. The regulators for the exciters are electrically interlocked with the liquid starters.

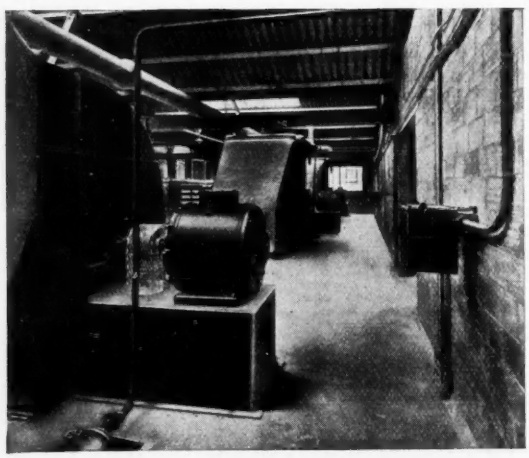
There are in addition two Bellis and Morcom two-crank two-stage gas compressors, each capable of compressing 415 ft. of carbon dioxide per minute. The delivery pressure is 60 lb. per sq. in. For driving these units 70 h.p. three-phase slip-ring induction motors are employed. These



VENTILATING PLANT, DRIVEN BY 30 H.P. "WITTON" SQUIRREL-CAGE MOTOR, 475 R.P.M.

motors are controlled by standard G.E.C. oil-immersed rotor starter panels including frame mounting pattern oil circuit-breakers with two overload trips, time lags and no-volt coil electrically interlocked with the rotor starter.

An industrial electric locomotive was required for hauling trucks between the point where the railway company hands them over, and the works. After careful consideration of various types of shunting locomotives it was decided to install an electric locomotive fed from an overhead line. The locomotive is of the double axle type and weighs 17 tons complete. The haulage undertaken consists of drawing in daily from the siding adjacent to the main line, truck loads of material which are taken up a hump where they are tipped ready for use in the special process in which the undertaking is engaged. Other work comprises the general shunting of light wagons for outgoing material. The duty specified was that the locomotive should be suitable for hauling 38 tons up a gradient of 1 in 22, and subsequent tests proved that the capacity of the locomotive gave a considerable margin over that specified. A further condition was that the locomotive



THREE HOT AIR DRYING FANS EACH DRIVEN BY A 30 H.P. "WITTON" SQUIRREL-CAGE MOTOR WITH STAR-DELTA STARTER.

should be capable of drawing a load of 100 tons up a gradient of 1 in 34, and here again the locomotive was found to be of ample capacity.

Acknowledgment is due to Mr. M. Robson, general manager of the Chemical and Insulating Co.'s works, for permission for this information and photographs to be published.

Protection for Cellulose Acetate in Sweden

A SWEDISH manufacturing company has suggested that cellulose acetates be exempted from import duty and that cellophane and similar products manufactured from it be protected by high duties. The Swedish office of chemical industry has advised against the adoption of the suggestion, however, chiefly on the ground that any day the production of cellulose acetates may be undertaken in the country. The principal raw products for their manufacture are cellulose and acetic acid, of which the former is produced in large quantities in Sweden. As for the acetic acid, it is produced chiefly from calcium carbide, which is also an important domestic product. Since 18 to 20 tons of carbide are required to produce one ton of cellulose acetate, a regular domestic production of the latter would eventually be a most valuable aid to the carbide industry, the more so since acetic acid can be produced from those lower grades of carbide that otherwise could not be utilised, but would have to be returned to the furnaces. Increased protection of cellophane and similar products manufactured from cellulose acetate is also recommended.

An Addition to British Chemical Standard Alloys

A NEW high-speed standard alloy steel "W" has been prepared for sale by British Chemical Standards, 3 Wilson Street, Middlesbrough. This steel has the following standardised percentage analysis:—Carbon 0.18, silicon 0.14, suplphur 0.051, Phosphorus 0.026, manganese 0.22, chromium 3.29, vanadium 0.82, tungsten 16.12, cobalt 4.35, nickel, 0.43, molybdenum 0.55. It will be noticed that in addition to the alloy elements which were in the original standard "W," the new standard contains molybdenum and will therefore be useful for checking all high-speed steel analyses, cobalt magnet steels and chrome-molybdenum steels. The certificate of analysis, including an outline of the methods used, gives the analytical results of nine independent analysts who are associated with large users of high-speed steel. A copy of the certificate is sent out with each bottle, which is sold in units of 25, 50, 100 and 500 grams.

Oil and Colour Chemists' Association

Annual Dinner

THE fourteenth annual dinner of the Oil and Colour Chemists' Association was held at the Connaught Rooms, Great Queen Street, London, on Friday, April 1, when Mr. Noel Heaton, the President, was in the chair. The guests included Mrs. Heaton; Mr. Eric Macfadyen, president of the Institution of the Rubber Industry; Mr. T. F. Spence, president of the National Federation of Associated Paint, Colour and Varnish Manufacturers; Mr. W. A. S. Calder, past-president of the Institution of Chemical Engineers; Mr. Martin S. Briggs, Board of Education; Mr. G. A. Campbell, chairman of the Manchester Section of the Oil and Colour Chemists' Association, and Mrs. Campbell; Mr. Bernard F. Howard, vice-president of the Institute of Chemistry; Mr. Henry G. Dowling, president of the Incorporated Institute of British Decorators; Mr. W. R. M. Lamb, secretary of the Royal Academy of Arts; Mr. Basil Oliver, Master of the Art Workers' Guild; Mr. J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers; and Mr. A. Vickers, president of the Paint Club.

Mr. ERIC MACFADYEN, president of the Institution of the Rubber Industry, proposed the toast of "The Oil and Colour Chemists' Association," and referred to it as a young but particularly lusty body. He had been interested to trace its growth from the days of the Paint and Varnish Society to the present time, to note how its membership had increased year by year practically without a break. This Association was one of the most enterprising and energetic of its kind; he was exhilarated to meet this body of technologists who were courageous enough still to devote an evening to good fellowship and re-union, in spite of existing conditions, which had proved too much altogether for so many kindred associations. Continuing in jocular vein, he said it was particularly kind of Mr. Noel Heaton to have invited him as a guest. It would have been easy to have overlooked that obscure and distant corner of the economic field in which he laboured, *i.e.*, the plantation branch of the rubber industry. There was a brilliant array of opulent presidents of kindred institutions who might have been invited, some of whom, at least, would have been able to return the compliment by inviting representatives of the Association to dinner. But, no! Mr. Heaton, having learned from his morning paper that rubber was being sold at less than 2d., had decided that this poor fellow from the Institution of the Rubber Industry would be glad of a square meal.

Functions of the Association

The PRESIDENT, responding to the toast, said that in his position on that occasion, seated between Mr. Macfadyen and Mr. Spence, who represented the rubber and the paint industries respectively, he was a kind of link between the two—and that was typical of the functions of the Association. It had always been his contention that one of its main functions was to act as a link between the academic and the practical, and between the technical man and the manufacture—a link, as it were, between science and art. Its ideal was to render service to art and to all the various industries linked up with the professions to which the members devoted their work. Perhaps he would be taunted for being an idealist, for often an idealist was referred to with derision; but he was rather proud of it, because it seemed to him that a man without an ideal to steer by was like a motor car with a defective steering gear. Such a man could not steer a straight course towards his objective, and became a potential danger to every other user of the highway of progress. The ideal of the Association was that of service, and one of its services was to endeavour to secure appreciation and recognition of the value of the technical chemist, for the technical chemist played an integral part in industry and in art and was destined to continue to do so in the future. The record of the Association, particularly during the past year, had proved that its endeavours to serve industry were being appreciated. The value of any organisation to industry was tested out particularly in times of adversity, and if it were not doing really good service it fell to pieces when the pinch came. The past year had been one of particular difficulty and adversity; yet the Association's membership had steadily increased, its finances had been maintained in a sound condition, and the attendances at its meetings had exceeded all records. It had established itself as an essential factor in the progress of the industries it served, and he maintained, further, that it was rendering national service, because it could justly claim that it was stabilising the technical foundations on which the paint industry and other industries, and the various arts connected with it, were fundamentally based. In so doing, it was assisting to some extent to maintain and develop the prestige of British manufactures, which had carried the products of these industries into every quarter of the world.

Pioneer Research in Industry

Mr. G. A. CAMPBELL, chairman of the Manchester Section of the Association, proposed the toast of "The Guests," and commented that his personal position was rather complicated, inasmuch as he was a member of the Association and, at the same time, a guest. He was particularly pleased to have been invited to attend as a guest on this occasion, however, because he regarded that circumstance as a recognition of the intimate relationship between the parent body in London and its outpost section in Manchester. That relationship had always been of the best, and it was due to the excellent co-operation between the parent body and the Manchester Section that the Association was in such a flourishing condition. He extended to all the guests a double welcome, first in their personal capacities, and secondly as the representatives of kindred societies, all treading the same path as the Oil and Colour Chemists' Association, or as representatives of the Board of Education, of societies interested in arts and crafts and in the application of the products of the Association's members for beauty's sake, and representatives of sociability and good-fellowship, as in the person of the president of the Paint Club. Coupling the names of Mr. Macfadyen and Mr. Spence with the toast, he referred to the work of the former as a pioneer in the raw rubber industry and as a pioneer of research in that industry—and research was the first stage by which technical and scientific associations proved the link between the academic and the practical world of everyday affairs. It was also very gratifying to welcome Mr. Spence personally, and as president of the Federation of Paint, Colour and Varnish Manufacturers. It was one of the aims of the Association to keep in close contact with the trade. Chemical industry had suffered during the past year in common with others but the fact that chemical industry and the paint industry in particular, was on such a sound footing was due largely to the perseverance of chemists and those associated with them in the development of industry.

Mr. T. F. SPENCE, president of the National Federation of Associated Paint, Colour and Varnish Manufacturers, responded on behalf of the guests, and took the opportunity to endorse what Mr. Campbell had said concerning the value of the chemist's work in industry to-day. In the course of 36 years' intimate experience of the paint and varnish industry it had often fallen to his lot to act as mediator between the chemist and the much abused practical man. He recalled that recently a man of wide business experience, who had recently returned from one of his regular trips to America, had assured him that the conditions of industry there were 25 per cent. worse than they had ever been in this country during the last four grey years through which we had passed. Was there ever such an opportunity for this country to regain what we thought it had lost? Was there ever a time when it would be greater folly for the administrators of this country to impose a tax upon the raw material of this industry, and so place it at a disadvantage with its American competitors? The next year would be England's opportunity, and he believed the next year was the opportunity of the oil and colour chemist.

Magnesium Chloride Exports from Germany

EXPORTS of magnesium chloride from Germany in 1931 declined to 35,200 metric tons or slightly below the 1929 figure of 36,600 tons. From a peak of about 43,000 tons in 1929 this trade fell to 40,230 tons in 1930. The recurrence of the decline is apparently due to smaller demand by the principal foreign buyers rather than to competition by exports from other countries.

The Application of X-Rays to Chemical Industry

Joint Lecture by Sir William Bragg and Dr. G. Shearer

THE London Section of the Society of Chemical Industry met at the Royal Institution on Monday, April 4, to hear Sir William Bragg, F.R.S., and Dr. G. Shearer lecture on the use of X-rays in the solution of chemical problems.

Dealing broadly with the subject, Sir William Bragg pointed out that the X-ray method of examination, being a diffraction method, depended on the existence of some orderliness of arrangement of atoms and molecules, and regularity of arrangement led, in the long run, to the crystalline form. This might appear to be a very great limitation of the application of X-rays, but the crystalline form was much more ubiquitous than we had thought. The diffraction pattern varied with the nature both of the substance and of the rays, and it depended on the arrangement of the experiment. Every substance in the world had its own pattern, which could not, if sufficient pains be taken, be confused with the pattern of any other substance; in other words, each compound wrote its own signature. One of the first applications of the method was that of analysis, and in a compound of oxygen and iron atoms, for example, the X-ray methods could tell without hesitation which iron oxides were present. Again, it must be possible, given sufficient skill and knowledge, to derive from the pattern the exact arrangement of the atoms and molecules in a given crystal, even the internal arrangement of the atoms themselves, so far as they could effect the X-rays. There was an enormous field for research in this direction.

An Aid to Chemical Analysis

Dr. G. Shearer, discussing some examples of the application of X-rays as an aid to chemical analysis, referred to the examination of two parts of a steel boiler tube which had collapsed in use. The examination showed a difference in grain size as between the two portions, and the difference between the diffraction patterns of the scale on the steel indicated a variation in the chemical constitution of the scale from one portion of the tube to the other. Comparing these with the patterns characteristic of the iron oxides Fe_2O_3 and Fe_3O_4, it was shown that one scale was practically pure Fe_2O_3, and the second contained both oxides. The X-ray method of investigating the constitution of the rolling scale on steels, the corrosion scales on copper and other metals, the action of ammonia on steel, the study of alloy systems, refractory materials, paints, photographic materials, the chemistry of soils, mineralogy, bio-chemistry were also dealt with. It was pointed out that a great advantage of X-ray investigation was that only a very small amount of material was required for the examination, and further, in the investigation of scale on metals it was not necessary to remove the scale. Of course, it had its limitations. The scale must be crystalline, but Dr. Shearer added, this condition would almost always be satisfied. In addition, the scale must not be too thin, otherwise the crystals would not contain a sufficient number of atomic planes to give rise to diffraction patterns. This ruled out the examination of certain protective films on metals by X-ray methods.

From a qualitative point of view, the X-ray diffraction pattern was more than useful in indicating the presence of a particular substance in a given material. Quantitative analysis by X-ray methods presented considerable difficulties and, in the present state of our knowledge, it was probable that an accurate quantitative analysis, when this could not be done readily by standard methods, was best accomplished by an X-ray analysis to identify the particular state of chemical combination of the constituents present in the material, with ordinary chemical analysis to determine their relative amounts.

Structure of Inorganic Compounds

In connection with the investigation of structures of compounds, in the domain of inorganic chemistry, Dr. Shearer mentioned the systematic study of the structures of the silicates by Professor W. L. Bragg and his co-workers at Manchester, which had shown that there were a few simple rules governing the structures of such compounds. Again, the researches in the Davy-Faraday Laboratory at the Royal Institution, especially those of Dr. Muller, had led to a very complete knowledge of the detailed structures of various compounds. The use of X-rays to determine the size of crystallites had many possible applications in the field of applied chemistry. It was only over a certain range of size that the method was practicable, but the method did become practicable when the crystals became too small to be seen in the microscope and when ordinary methods of measurement became impossible. The size of the crystal grains played an important part in many of the materials used in the paint industry, and in the electro-deposition of metals. Attempts were being made to use X-ray methods to explain the phenomena of catalysts and to discover the conditions favourable to efficient catalytic action.

Complicating Factors in Catalysis

Professor Hilditch's Address at Huddersfield

THE twelfth annual meeting of the Huddersfield Section of the Institute of Chemistry was held at Huddersfield on March 15, when Mr. H. W. Moss presided over a good attendance. The resignation of Dr. Stephen, hon. secretary, was accepted with regret, and the chairman and Dr. Everest spoke appreciatively of the work he had done during the past three years. Dr. R. J. Connor was appointed as the new hon. secretary, and Dr. Goldthorpe and Dr. Stephen were elected to the vacancies on the committee.

After the business meeting, an address was given by Professor T. P. Hilditch, of Liverpool University, on "Some Complicating Factors in Industrial Catalysis." Catalytic processes, he said, afforded particularly good instances of the factors, other than chemical, which were involved in problems connected with modern chemical industry, and emphasis was laid on the importance of chemists being prepared to share in the responsibility for these factors as well as merely to be responsible for dealing with the purely chemical problems concerned. It was urgent, in the words of the 1931 report of the Advisory Council of the Department of Scientific and Industrial Research, that the scientific outlook should be represented "not only among the subordinate staff, but in the high places," and that would not become the general rule until chemists interested themselves actively by study and mutual interchange of views in the economics, as well as in the chemistry, of manufactured chemicals.

As a result of the development of some recent catalytic methods, certain facts were obvious, and it appeared that chemists had not been unduly conspicuous by their representations in the higher commands of the Industries concerned. In the first place, a modern catalytic process almost always demanded heavy capital expenditure, and could therefore only be undertaken by a corporation of some magnitude or by a Government or municipal undertaking. Secondly, the possible effect of a successful process of the kind had been shown to be far-reaching, and might have repercussions of an unfortunate character on numerous individuals in so-called lower walks of life. For instance, the synthetic acetic acid and acetone industry, followed by synthetic methyl alcohol, had entirely upset the old wood-distillation industry. In the third place, either the tremendous capacity of modern catalytic plants had been under-rated, or competition had run mad, and the installations for such manufactures as ammonia, nitric acid, hardened fats, acetone and other commodities available throughout the world were far in excess of likely demands in the near future. Finally, the catalytic processes required far less labour than the older processes, so that less employment was available. The combined effect of these various factors might therefore become serious and continue to add to the difficulties from which industry was suffering.

It seemed, therefore, that it was by no means sufficient to invent a process or introduce improvements; it was some-

one's business to see that scientific advances were utilised for the general good. Perhaps it appeared rather far-fetched to suppose that the work of the scientist was in danger of being thus misunderstood, but the lecturer quoted several extracts from the Press touching on some of the new catalytic processes, and these illustrated clearly how science was misapplied. Progress must continue, and, so far as discovery and invention were concerned, it would fortunately be impossible to stop progress. But, if by unintelligent use of applied science, the progress of human welfare and comfort seemed to be impeded, there was a grave danger that science would acquire a bad name with the world at large and the progress of discovery and invention would be impeded. Neither squalor and dirt nor unemployment and distress should be the result of scientific progress. It was easier to point to these things than to show the way out. It was easy, also, to allocate responsibility to some extent. In the lecturer's opinion, the fault was twofold; first, that those who had controlled the application of scientific discoveries had not had the requisite foresight and imagination to comprehend whither they were going and what manner of power they were utilising, and second, that those in control had too often not looked far beyond their own interest.

Professor Hilditch proceeded to illustrate his argument by a discussion of the volatile organic solvents and related compounds which were formerly derived exclusively from the by-products of the distillation of wood, but which are at present produced in large quantities from acetylene, alcohol, water gas or starch by a large variety of catalytic methods, including fermentation. Amazing fluctuations in prosperity and policy of these industries had occurred during the past twenty years, owing to the operations of factors, which, for the most part, had no direct connection with the chemical processes themselves, and emphasised the necessity for chemists occupying themselves with matters beyond the actual chemical and technical problems of a business.

In conclusion, Professor Hilditch reminded his hearers that a chemist's primary function was to be thoroughly efficient as a chemist and that his chief satisfaction and enjoyment should lie in the capable execution of his work. But, he argued, his chief duty, after due attention to his efficiency as a chemist, was to arm himself by studying economics and similar problems to play his part in the larger questions and to exert his influence as opportunity afforded in the wider spheres connected with the application of chemistry to industry.

The British China Clay Industry

Its Past and Its Future

CHINA clay production which is one of the most versatile of British industries has been passing through a very critical period in its history since the spring of 1930, and to a large extent the prevailing adversity is attributable to a lack of cohesion among the producers themselves.

Although declining shipments may be beyond the control of the individual controller, yet it cannot be denied that any industry that is strangling itself in a cutting price feud cannot be expected to devote its activities to the recovery or extension of lost markets. The break up of the China Clay Association at the end of 1930 was nothing short of a calamity to the industry, and the whole china clay community in consequence of the eventual results. Instead of being able to speak and act with a united voice, and investigate the causes of the declining markets and search for other avenues for outlet, the producers have been engaged in meeting a promiscuous competition by an almost ruthless form of economy, and in many instances the china clay works are temporarily closed down. Whilst every other industry has its association, even the china stone producers have an organisation which has been successfully carried on since its inception, it seems incredible that such a large and important body of business men associated with the china clay trade have been content to remain so long without showing some action.

Downward Trend of Shipments

The new year opened with a continuation of the downward trend in the china clay shipments and the gravest anxiety has been felt by those who have large investments in the industry and the china clay workers who are to-day swelling the local ranks of the unemployed, and it seemed as if the industry was simply drifting to its own abyss. In the early part of March the whole industry was stirred by a communication from the Federation of British Industries which had reference to the proposal of the French Government to put a tariff on the imports of British china clay into France. A meeting had been held at the offices of the Federation of British Industries at the request of the Confederation Generale de la Production Française, between representatives of the French National Association of China Clay Producers and the representatives of certain English concerns nominated by the Confederation Generale as being more particularly interested in the French market, to consider the best ways and means of obviating the fixing of a quota by the French Government. There was no representative body to speak on behalf of the English china clay producing companies, consequently it was impossible to come to any decision. Those representing the Devon and Cornwall china clay trade, however, suggested that the Federation of British Industries should call all the English china clay producers with a view to the formation of an association to enter into negotiations with the French producers and deal with other matters affecting the trade.

The meeting was held at Sanstell on March 18, and Mr. A. C. Rouse of the Federation of British Industries presided. Practically the whole of the British china clay industry was represented and a striking feeling of unanimity prevailed. The chairman outlined the position and pointed out that the objects of the new association had nothing whatever to do with prices, being described as a "general purposes association" with headquarters in London, and an independent chairman. Such a decision has given an unqualified hope to the industry and a large community, especially in the Sanstell district, who are depending upon the prosperity of the china clay trade for its livelihood, and it is hoped that it may eventually lead to an organisation of much larger scope and of a closer relationship between all producers.

The Need for a China Clay Institute

In the course of a recent lecture at the Camborne School of Mines, Mr. A. R. Davies, manager of the Rosemellyn China Works, near Bugle, said that until recently the examination of the physical and chemical properties of china clay had not received very great attention by the producers. Its production, however, was definitely not the automatic process it appears to be. He doubted whether any mining engineer present or anywhere else could undertake the successful production of china clay, without spending an apprenticeship in prospecting, washing, refining, and testing clays and studying the effect of heat on the particular clay produced. It is an industry which will, within the next few years, afford an outlet for skilled engineers, but they must first be trained in the industry. Technical knowledge is important but it must be based on sound practical knowledge. The need for greater knowledge concerning the properties of china clay goes on increasing. Competition is rapidly making chemists even of our farmers and the future china clay producer will be rather a fearsome individual in the vastness of his technical knowledge, when compared with his much happier equivalent a generation ago. He would not be surprised to find a department devoted to china clay production at the Camborne School of Mines. What was needed at Sanstell is an institute for the china clay industry, and if the china clay industry had had such an institute years ago a very large amount of capital which has been spent on costly experiments would have been killed at its birth.

German Alkali Production

SODA ash production in Germany is reported to have declined in the past two years to around 600,000 metric tons annually, indicative of the depression of its consuming industries, notably glass, dyes, soap, paper, and textiles. However, the caustic soda production of 110,000 to 120,000 metric tons annually appears to have held its own. The annual German production of caustic potash is estimated at around 50,000 metric tons.

New Technical Books

QUALITATIVE CHEMICAL ANALYSIS. By Louis J. Curtman, pp. 539. Macmillan and Co., Ltd. 16s. net.

ANALYSIS is here treated from the standpoint of laws of equilibrium and the ionisation theory. It is the author's conviction that preliminary experiments, when intelligently performed, constitute the logical preparation for systematic analysis. A descriptive section has therefore been provided in which all the important reactions in qualitative analysis are considered. This section, indeed, is an indispensable part of any book on qualitative analysis since it supplies the needed text for study and reference. In the preparation of the text, the author has consulted a number of standard books, and amongst others he acknowledges his indebtedness to Stieglitz, Fresenius, Treadwell-Hall, and Lattimer and Hildebrand.

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PHYSICAL CHEMISTRY FOR COLLEGES. By E. B. Millard. Third Edition, pp. 522. McGraw-Hill Publishing Co., Ltd. 18s. 9d. net.

IN this book the limitations of orthodox laws of physical chemistry have been emphasised more than is commonly done in such courses of physical chemistry. To this end the illustrative data have been carefully chosen from modern experimental work in order to minimise the "experimental errors" which are so often used to conceal the real deviations of a law from the facts it is intended to express. It is assumed that the student is familiar with inorganic and analytical chemistry, that he has had an adequate course in college physics, and that the simple processes of calculus are familiar to him. The first chapters deal with the determination of atomic weights, the properties of substances in gaseous, liquid and solid state; then follows the subject of solution, thermochemistry, equilibrium, the kinetics of reaction, molecular and atomic structure, radioactive changes, colloids and electrochemistry.

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THE CHEMICAL ACTIVITIES OF MICRO-ORGANISMS. By Dr. A. J. Kluyver, pp. 109. University of London Press, Ltd. 4s. 6d. net.

THIS book contains three lectures delivered by the author at London University, May, 1930. The aim of these lectures was to show that a judicious selection of the experimental material available concerning microbial metabolism allowed of logical deductions as to the fundamentals of biochemistry. Stress has been laid on the primary necessity of attempting to arrive at a more detailed knowledge of the inner mechanism of bio-chemical conversions. The idea that biochemical processes can be reduced to a series of quite intelligible primary reactions is not uncommon to biological thought. It is, however, somewhat surprising that only very seldom are attempts made to carry this principle fully through. This is undoubtedly due to the fact that biochemists are rather unwilling to accept the thesis, maintained in these lectures, that the evidence for the occurrence of a special intermediate stage in a biochemical process can only be of an indirect nature.

* * *

THE PREPARATION OF PURE INORGANIC SUBSTANCES. By E. H. Archibald, pp. 383. Chapman and Hall, Ltd. 23s. net.

AS its title indicates, this book concerns the preparation of inorganic substances of a high degree of purity, the need for such a book being urged by the advances which have been made in chemical science during the past thirty years. The grouping of the products dealt with is based on the periodic classification. Only those methods of procedure have been included that have been proved to produce what may be definitely considered as a pure substance; and frequently it will be noticed that the purification process for the less-used substances demands a much longer description than that for better-known and merely closely defined substances. In cases where a well-known chemical is not included it is because there is no direct information on record concerning that particular substance.

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THE SORPTION OF GASES AND VAPOURS BY SOLIDS. By James William McBain, pp. 577. George Routledge and Sons, Ltd. 25s. net.

THE publication of this monograph was inspired by invitation to give a series of special lectures at the University College of Wales in October, 1928. The first part of the book is of historical and general nature, but includes a chapter on methods of measurement and evaluation of the results. The second section concerns experimental data, and deals in turn with sorption by charcoal, zeolites, silica, porous rigid jellies and oxides, glass, metals, cellulose derivatives and other non-rigid gels and jellies. The hypotheses and theory of sorption are discussed in a third section, wherein there is a chapter on evidence from contact catalysis as to the nature of sorption. The extensive bibliographical references which are given should be of substantial assistance to those interested in this rapidly extending science.

Honest Doubt

Sir Ernest Benn on the Price of Modern Politics

WHEN Sir Ernest Benn's book *Account Rendered* was published in the autumn of 1930 the politicians had no inkling of the coming storm which was to sweep Great Britain off the gold standard and to precipitate her into a world of entirely new conceptions and values. The events of last August, however, could not have taken by surprise the reader of *Account Rendered* for all the elements of the economic crisis had been accurately analysed by the author. So great a change had taken place in public opinion that the prophecy accepted by the limited few in 1930 became the text book of 1931. The argument of *Account Rendered* was confined to the financial and economic aspects of home affairs. Sir Ernest Benn now appears with a new volume, *Honest Doubt* (Benn, 6s., published to-day), in which he deals with the philosophic principles underlying the modern world muddle. In a brilliant first chapter Sir Ernest Benn justifies his choice of a title. He finds that Tennyson's revolutionary line now reflects the sincere opinion of the great majority, and asks whether mankind is going on or slipping back. This leads him to pose a series of pertinent questions which come to the serious reader of the morning newspaper, as he is invited "to approve of schemes for wages without work, exports without imports, gains without pains, taxes without trade, authority without knowledge, improvement without competition, and life without liberty." Can we have rights without responsibilities? Are there any principles left in politics? Is the family conception still good? Is it permissible to think for ourselves? Is competition an evil? Is wealth desirable in itself? Can legislation promote morals? Does gain involve loss? What are the ideals of leadership? Lastly, what is liberty? These questions suggest very profound subjects but Sir Ernest Benn tackles them with a wealth of simple illustration which makes his writing pleasantly easy to follow. His obvious purpose is to make the plain citizen of these islands think out for himself the implications of his position in the nation, and of the nation's position in the world. He is a patriot who holds that no country in the world can hold a candle to England, and gives reasons for doubting the wisdom of over-concentration on the popular slogan "Buy British." He glories in the leadership of the world which Great Britain once enjoyed and calls for its reassertion even at the expense of revising some of our thoughts about the League of Nations.

Sir Ernest Benn provides a useful reply to the short-sighted politicians who wish to nationalise the banks, and he has some pointed criticism to make of the popular pastime of "planning" stimulated by those who think that there may, after all, be something in the Russian five-year plan. He passes by easy and rapid steps from one great problem to another and links them all with his plea for a return to individual responsibility. In his final chapter he asks every member of Parliament or town councillor to ask himself these three questions before consenting to put new obligations on the taxpayers or ratepayers:—"First, is the work worth doing? Is the need for it real? Second, is there no other way of achieving the same object, no cheaper or more efficient or more reliable agency through which it can be secured? Third, have we the money to pay for it?" The author has laid the entire community, and especially the business world, under a great obligation by his penetrating analysis of the follies of the time and his formulation of a body of principles which his most severe critics will find great difficulty in refuting.

Whiting and Whiting Substitutes

Market Requirements

The many uses and general requirements of whiting and whiting substitutes are outlined in Information Circular 6482 of the United States Bureau of Mines, from which the following notes are extracted.

TRUE whiting, low in magnesium, is an important filler in rubber used for motor tyres. Some manufacturers use whiting substitutes, but others object to them, although for certain types of rubber products, such as shoe soles and heels, whiting substitutes have been found quite satisfactory. Whiting is also used as a filler in linoleum, sometimes forming 20 per cent. "Off-colour" products may be used as asphalt filler. It is used as a coating on glazed paper, but in cigarette papers, some of which contain as much as 30 per cent. of whiting, it performs quite a different function. Here the heat of burning tobacco drives off the carbon dioxide gas of the whiting, which opens the pores of the paper, thus promoting combustion without the formation of smoke. Other products in which whiting is an important constituent include white ink, dressing for white shoes, picture-frame mouldings, dolls, wire insulation, dyes, tooth paste, and fireworks. It it used for facing moulds and cores used in brass casting and as a mild abrasive for polishing metals. Whiting is also used in a small way in many industries, including structural iron, shipbuilding, locomotive works, file manufacture, explosives, medicines, printing and engraving, and the manufacture of shoes. It is employed as a neutralising agent in fermentation processes.

Purification of Chalk

In the older types of mills crude imported chalk is ground wet with edge runners. Material is brought to grinders in wheelbarrows or cars rather than by mechanical means, because flint balls which are associated with chalk are picked out by hand. The milk-like suspension of ground chalk is then conveyed to a series of settling tanks, where the sand settles first and is discarded as waste. The highest grade of whiting remains in suspension longest. A cruder "Commercial" form is obtained from the first tank. The overflow, which requires a longer period for settlement, supplies the "gilders" or "extra gilders" whiting deposited in the intermediate tanks. From these the overflow passes to a final tank, where after a still longer period of settlement a high-grade product known as "Paris white" is obtained. The overflow from the last tank is returned to the grinding mills. The whiting sludge from the settling tanks is either filter-pressed or evaporated to partial dryness, and final drying, which may occupy four weeks, is accomplished in heated chambers. The dried product is disintegrated, passed through a bolting machine, and packed in burlap bags of 50 or 100 pounds capacity.

In the more modern types of mill, crude lump chalk is passed through crushing rolls and disintegrated in a series of mullers. The sludge, consisting of about 11 parts of water to 1 part of solid, is then conveyed to a series of bowl classifiers hydro-separators, and thickeners, where a large proportion of the water is removed. The pulp is de-watered further in a continuous filter, and final drying is accomplished in a rotary dryer which discharges to a storage bin from which the product is taken for disintegrating and bolting. This type of equipment yields only one grade of whiting at any one time; two or more complete units would be required to produce more than one grade simultaneously. The newer type of equipment greatly increases mill capacity, reduces labour requirements and production cost, and provides a very uniform and dependable product.

During the process of manufacture of whiting from chalk there is a shrinkage of about 20 per cent. in weight, most of the loss being the water content of the crude chalk. Moisture in finished whiting ordinarily does not exceed 0.7 per cent. In England, manufacture is centred in Kent. The quarried chalk is placed in a 15-foot washing tank and pulverised by means of iron bars suspended from rotating arms. The slurry passes through a $\frac{1}{8}$ in. wire screen to a launder, which feeds it to eight trommels fitted with 180-mess wire gauze. Only the material that passes through these screens is used for whiting. The fine slurry is conveyed to four series of settling pits with eight pits in each series. The slurry fills the first pit, flows over into the second, and so on until the eight are filled. The finer material is thus carried over and settles in the last four pits, the product of which is classed as No. 1 grade; that deposited in the first four is graded No. 2. The overflow from the pits is then conveyed back to the washing tank. The whiting is dug out by hand and placed on drying doors which have heating flues beneath them, and after drying over a period of 36 hours it is taken by screw conveyor to a swing-hammer disintegrator which discharges to a bolting trommel.

Whiting Substitute from Natural Rock

Limestone and marble are pulverised and graded by two processes—the wet method and the dry method. In a typical wet process for manufacturing marble flour, the marble chips are ground wet in a pebble mill, and the mill discharge is pumped to two settling cones where the settled product is returned in closed circuit to the pebble mill and the overflow conveyed to settling tanks. The sediment from the settling tanks, containing about 50 per cent. of moisture, is then dried in a type of drum drier which finds successful use in a number of southern plant. Steam at 75 lb. pressure passes through a hollow shaft to the inside of the drum, beneath which is a rotating shaft with $\frac{3}{8}$ in. iron pegs that splash the slurry mixture from a trough to the face of the drum. A series of scrapers, each about 1 foot long and held to the drum with springs, scrape off dried material to a screw conveyor and lumps are broken up by an impact pulveriser. The drying capacity is 8 to 12 tons per drum per 24-hour day.

In general, limestone flour that will successfully meet the requirements of fillers of a type like whiting or china clay should be sized uniformly to about 300 mesh. Chemical purity, though not essential, is desirable, as snow-white powder is chiefly in demand.

Precipitated Calcium Carbonate

In the manufacture of precipitated calcium carbonate calcium oxide (quicklime) and carbon dioxide are the raw materials. Very pure lime is required for the manufacture of precipitated chalk. It is first slaked in water, and sufficient water is then added to make a thin milk-of-lime suspension, and to remove all particles that do not disintegrate the milk of lime is passed through a fine screen. Carbon dioxide gas, the second raw material, is manufactured by burning coke. Pure gas is desired; and to remove acids, dust, and moisture it is passed through "scrubbers" in the form of towers which contain limestone and excelsior.

The milk-of-lime suspension, which resembles cream, is placed in upright cylinders about 18 feet high and 6 feet in diameter. Purified gas is blown in at the bottom of the cylinders, and as it comes in contact with lime particles chemical combination takes place according to the formula $Ca(OH)_2 + CO_2 = CaCO_3 + H_2O$. Recarbonation requires two to three hours; completion of the reaction is determined by an indicator, such as phenolphthalein. Sometimes closed tanks, equipped with agitators, are used. This carbonation process must be carried out under exact and carefully controlled conditions. The precipitate of calcium carbonate is de-watered in filter presses, and the filter cakes are dried in hot-air tunnels at about 160° F. The dried cakes are ultimately pulverised and the finished article packed in paper-lined bags or barrels.

Three leading grades of precipitated calcium carbonate are recognised in the trade—extra light, light, and heavy; the principal difference is in density. Most of the production is of the light grade, and its principal use is in the manufacture of tooth paste. Individual manufacturers of tooth paste have their own standards of quality, and there are no exact or generally accepted specifications or methods of testing. Determination of the adaptability of a precipitated calcium carbonate for tooth-paste manufacture generally includes tests of density, sedimentation, wet bulk, alkalinity, and fineness.

Some New Products of American Origin

Derivatives of Poly-Alkyl Glycols

A NEW range of products has been recently produced as a result of pioneer research work by Glycol Products Co., Inc., of New York. This firm already has a number of products to its credit, which are now being commercially used in the United States, but its more recent work is concerned with emulsions, the theory and practical use of which has been neglected.

Glycera Wax

By the esterification of poly-alkyl glycols with oleic and stearic acids two products having useful properties are now made in commercial quantities—di-glycol oleate and di-glycol stearate. The former is a brown oily liquid, soluble in alcohol, hydrocarbons and esters, which can be used as a softener for varnish, gums and resins, and rubber. It has the advantage of being a liquid soap which is permanently non-alkaline, and therefore injurious to delicate fibres, colours and other materials. As an emulsifying agent it is recommended for motor car and general furniture polishes. Di-glycol stearate is a wax-like solid product, almost white in colour, with a melting point of 58° C.; this is a new emulsifying agent with a wide range of uses.

Glycera wax is another new synthetic in the same series. Of light tan colour with a melting point of about 140° F., it is more soluble that any natural wax. Turpentine will dissolve more than 12 per cent. of its weight to give a lasting clear solution; it can be dispersed in water readily, without emulsifying agents, although itself insoluble in water; it blends readily with other waxes and resins, acts as a softener in rubber and as a plasticiser in lacquers.

Aquaresin

Aquaresin, another new product, has a wide range of application. By mixing water solutions of aquaresin and water-soluble gums, such as gum arabic, in suitable proportions, films or coatings of varying degrees of hardness and flexibility are obtained. For some time past, research has been carried on by manufacturers of photographic films, collodions, lacquers and gelatin products, to obtain a product which would be mutually compatible with gelatin and pyroxylin or water insoluble gums and resins, such as copal. This, we understand, has been accomplished through the use of aquaresin. The latter is dissolved in methanol, anhydrous alcohol, cellosolve or methyl cellosolve; the water insoluble gum or pyroxylin is dissolved in suitable mixtures of these solvents. The two solutions are compatible and are mixed for use. Such solutions are arousing interest in special adhesives for cellophane, glassine and other special papers, leather and textiles. In conjunction with rubber latex, aquaresin gives additional tackiness to the deposited rubber film. The new water-soluble resin is of additional interest where a viscous medium is desired, which will give off molecular water on heating or electrolysis, but which will later reabsorb this moisture from the atmosphere. Aquaresin is sticky, non-drying, tasteless, odourless, light amber in colour, water soluble, insoluble in hydrocarbons, neutral, non-corrosive, non-toxic, and antiseptic.

Uses suggested for this product include that of a plasticiser for glues, gelatin, gum arabic, tragacanth, karaya, etc.; as a sealing medium for joints in systems carrying oils and other organic fluids; as a fire retardant for treating paper, leather, textiles, etc.; and as an adhesive (non-drying) for glass, leather, wood, and textiles. It can also be used as a textile lubricant, softener, lustreing agent and preventive of mildew. It dissolves in methyl cellosolve and is used as a special adhesive for glassine, cellophane, and celluloid; it is also soluble in glycerin and diethylene glycol, methanol and anhydrous alcohol.

Ammonium Linoleate Paste

We understand that Messrs. Rex Campbell and Co., Ltd., of 7 Idol Lane, London, E.C.3, have been appointed sales representatives for the products of the Glycol Co., Inc., in the United Kingdom, and to this firm we are indebted for the above technical information. Among other products produced by this concern is an ammonium linoleate paste, which is of special interest to textile chemists. This product is suitable for the emulsification of oils, fats, and waxes which are intended for twisting, winding, sizing and finishing of all types of textile fibres, especially those of the rayon class.

Extended Uses for Aluminium Metal

Results of International Competition

THE first competition organised at the beginning of 1931 by the International Aluminium Bureau, with the object of finding and rewarding those inventions which promised further developments of the uses of aluminium and its alloys, met with approval in scientific and industrial circles. Nearly one thousand persons in twenty-six different countries approached the Bureau for information regarding the competition, and over three hundred entries were submitted before the closing date. Although many of the entries contained interesting proposals showing a considerable knowledge of the properties of the light metal, no proposal was of sufficient novelty or character to enable the judges to award the special prize of 50,000 frs., though the number containing ideas of merit was sufficient to make the adjudication a difficult and delicate task. Some entries covered ingenious inventions which would give improvements in the apparatus concerned, but did not show any real outlet for aluminium, and in consequence had to be rejected for this reason, since they were not strictly in accordance with the object of the competition. Other entries were rejected because the suggestions, though interesting, had not been developed to a point where tests could prove their efficiency or permit manufacture to be started.

The judges finally retained two proposals as being of interest and possible of immediate application, and awarded the two prizes of 25,000 frs. to the authors of the entries dealing respectively with aluminium in leather dressing and skin dyeing (Mr. C. Szmukler, Director of Etab. Reynier, Grenoble, Isère, France), and the construction of central heating radiators. More than ten entries were received dealing with the question of radiators, and two of these were selected as the best, the judges dividing the prize of 25,000 frs. between Mr. G. de Haes, of 3 Rue Veetreyde, Brussels, who submitted a thesis on finned radiators, and Dr. Hampel, of Elsasserstr. 15, Podejuch, b/Stettin, Germany, who discussed the question of the tubular radiator.

The rules of the competition, by limiting the number of prizes, necessitated a severe selection and many original ideas with some value for the development of the uses of aluminium could not be rewarded. The Bureau therefore considered it would be useful to compile a brochure of abstracts of a number of entries dealing with a variety of subjects—not necessarily new ideas—but to give some suggestion of the applications of the light metals, so that specialists could study the possibility of application in their own industry. The abstracts given in this brochure are necessarily brief and are only intended to give the main idea of the proposed application, but the addresses of the entrants concerned are given with each abstract so that interested persons can get into direct touch with the authors for more detailed information. Copies of this brochure can be obtained on application to the British Aluminium Co., Ltd., Adelaide House, King William Street, London, E.C.4.

As a result of the success of the first competition it has been decided to organise in 1932 a second international competition with prizes amounting to 100,000 frs. The rules of this competition differ slightly from those of the previous year, and a copy will be sent free to persons requesting same from the International Aluminium Bureau, 23 bis, Rue de Balzac, Paris. Entrants who require literature on light alloys to assist their studies can obtain data from either the Bureau or from the English Section of the Bureau at the offices of the British Aluminium Co., Ltd., London.

News from the Allied Industries

Iron and Steel

REPORTING UPON THE WEEKLY MARKET, *The Birmingham Post* states that nothing has occurred to give any new impulse to the iron market. Orders were being sought to justify an early return to productive activity at mills and forges that have been making holiday, and others that have resumed with dubious prospects. Some foundrymen have restarted with good hope of going ahead for a while. The Central Pig Iron Producers' Association met as usual on the eve of the new month to take counsel as to the outlook, Sir Francis Joseph presiding. A communique issued at the close of the meeting intimated that there would be no change in prices. Blast-furnacemen, like their customers, are in a listening attitude. They want to hear what the Commission, to whom the scheme of tariffs has been referred, has to say to the demand for special treatment of iron and steel imports. No foreign pig-iron or forge or foundry quality is now coming into the Midlands. The home producers were able to limit the competition by their own exertions; since then a widened radius has been secured to British blast-furnacemen through the operation of exchange and the general 10 per cent. duty.

REPORTS ARE WIDESPREAD IN NEW YORK to the effect that the U.S. Steel Corporation's dividend is to be omitted when the directors meet on April 26. Thereafter the management is expected to take up the question of a further reduction in wages. In some quarters it is believed that the reduction may be more than the 10 per cent. cut previously ordered.

Cement Industry

THAT THE BRITISH PORTLAND CEMENT CO. should have been able to make record deliveries of its product in 1931, as the chairman reported at the company meeting held on March 31, is an indication of its strong position in the industry. The record deliveries were made at lower prices than before, so that the company did not gain the full benefit of its higher sales. Falling prices in the cement industry are not a product of the slump alone. In the time of general prosperity before 1929 competition among cement manufacturers was already leading to price cutting. It was no doubt to this that Mr. Malcolm Stewart was referring when he said that the buying up of the Red Triangle group last year, though not of direct interest to the company, would lead to greater stability in the industry.

THE ANNOUNCEMENT THAT THE DIVIDEND would be maintained and the good results of the subsidiary, British Portland Cement Manufacturers, Ltd., prepared shareholders of Associated Portland Cement Manufacturers, Ltd., for a favourable report, and the accounts now presented show that total revenue increased by £69,562, to £1,024,712. This figure includes the net profit as from July 1, 1931, of the "Red Triangle" group, the cement and brick undertakings of which were acquired last year. The expenses in connection with the purchases have been written off partly from trading profits and partly from contingencies reserve. A total of £312,150, against £267,150, is set aside for depreciation, and after providing for dividends (the Ordinary issued in August receive 4 per cent.), the carry-forward is raised by £2,463, to £163,427. The principal balance-sheet changes are due to the incorporation of the "Red Triangle" assets, and to the issue of capital necessitated by such purchases. Estates, properties, machinery and plant have risen from £5,847,082 to £7,405,709; stock is £561,130 against £502,340, and debtors are up by over £312,000, to £1,167,657. Creditors, etc., have risen from £648,626 to £806,952.

Paper Making

THAT FAR TOO LITTLE ATTENTION was paid by papermakers to the possibility of extracting chemical by-products from esparto grass was stated at a recent meeting of the South of Scotland branch of the Technical Section of the Papermakers' Association of Great Britain and Ireland held in Edinburgh, when Mr. James MacGregor, of Ernest Scott and Co., Ltd., read a paper on "The Manufacture of Chemical Products from the Non-Cellulosic Constituents of Esparto Grass with the Recovery of Soda." Mr. MacGregor said that the soda recovery department of an esparto mill was usually regarded as a necessary evil, but the wise papermaker recognised that it paid to maintain efficiency in that department which only too frequently was the last to receive consideration when expenditure on modernisation of plant was under discussion. If in the production of coke the gas engineer allowed the resultant gas to be burnt in the atmosphere and the liquid distillates run to waste, or if a manufacturer of cattle feeding stuffs imported oil seeds and, contenting himself with the cake or meal, he similarly wasted the expressed oil, the folly displayed would only be on a par with the present treatment of esparto grass. Of the vast quantity of esparto used to-day, the greater part of which was used in Scotland, only about 45 per cent. was obtained as pulp. Apart from the waste heat derived from the incineration of the organic matter removed in digestion, and the wax which was recovered on a small scale by one enterprising mill, no value whatever was derived from the balance. There was no ground for contending that the carbonisation of the black esparto liquor and the production of clean caustic liquor under Dr. E. L. Rinman's process would introduce problems more serious than were attached to the present methods of incineration and caustication.

Rubber

THE COUNCIL OF THE RUBBER GROWERS' ASSOCIATION has decided that it will not put forward any recommendations for reopening negotiations with the British and Netherlands Governments with regard to the control of the production or export of rubber, or consider any schemes for regulation of supplies on a voluntary basis. All negotiations on this subject between the Association and the Government are in the Council's opinion, which has been conveyed to the members in a circular letter, brought to an end by the recent decision of the two Governments that under present conditions it is impossible to frame and operate an international scheme to this end. With regard to reduction of expenditure, the circular recalls the efforts made by the association over a period of years to obtain relief to the industry in connection with various charges devolving upon rubber growers. The Council considers that the attention of the Governments of Ceylon, Malaya, and the Netherlands East Indies should be drawn to the desirability of directing, in the immediate future, as much Eastern research as possible to problems connected with modified rubbers, rubber derivatives, latex, and raw rubber, with a view to their utilisation in new commercial projects, rather than to a continuation of research having for its immediate object an increase in crops. The funds at the disposal of the industry for technical research and development of new uses are, however, strictly limited, and it should be the aim of the Association to endeavour, as early as possible, to place this important work on an international basis.

Perfumery and Cosmetics

IN ORDER TO AVOID THE TARIFFS, M. Coty, the French perfumery manufacturer, is to build a £50,000 factory on the Great West Road at Brentford, Middlesex. Work will start on the first section next week, and will be completed by July. Three hundred English girls will be employed, but when the whole site—nearly two acres—is developed, there will be work for 2,000. In a recent interview with the Press, M. Valli, a director of the company, said that the ultimate size of the factory depends on the result of the Ottawa Conference. At present, Empire business is done from Paris, but if the Dominions give British manufactures preference all this business will be done from the new factory here. In that event the company will be turning out well over £1,000,000 worth of goods a year. Although essences will still have to come from abroad, the company will try to procure bottles and the raw material for soaps in England. The Coty Manufacturing Co., Ltd., of Coty House, 3 Stratford Place, London, W., was registered on March 24, 1932, to enter into an agreement with Coty Société Anonyme of France, and to carry on the business of manufacturers of perfumery, etc. The nominal capital is £50,000 in £1 shares. The directors include F. M. J. S. Coty, 31 Avenue Foch, Paris; R. Greilsamer, 21 Avenue Pierre, 1'er de Serbie, Paris; C. C. Valli, 42 Crediton Hill, N.W.; E. L. Burgin, 3 Grays Inn place, W.C.; A. Lavault, 20 Place Felix Faure, Paris; J. A. L. Polverelli, 7 Guillaume, Lenor, Suresnes, Seine, France; L. A. R. Marais, 13 Boulevard de Versailles, Suresnes; A. Dubois, 115 Avenue Victor Hugo, Paris.

Chemical Industry Lawn Tennis Tournament

Entry Lists Now Open

ENTRIES are now being received for the second annual Chemical Industry Lawn Tennis Tournament, for which THE CHEMICAL AGE has presented a handsome silver cup. The first tournament last year was followed with the keenest interest throughout by many firms in the chemical industry, and we look forward to a more widespread interest this year. The tournament is limited to men's doubles and is open to all engaged in the chemical industry throughout the country. Country members are particularly invited to compete, as arrangements will be made to divide the country into areas to enable competitors to contest the early rounds in their own districts.

The rules governing the tournament have been printed in full in the last two issues of THE CHEMICAL AGE, and further copies may be obtained on application to the Editor. An entry form is appended, and those who contemplate competing for the cup are reminded that their entries must be received not later than May 2. They should be sent in as much earlier as possible, to facilitate the arrangements for district grouping.

[The Latest Date for Receiving Entries is May 2, 1932].

Cut along this line and post as directed.

Entry Form

We have read the Rules of THE CHEMICAL AGE Lawn Tennis Tournament, and agree to abide by them.

Name of Competitor .....

Name of Firm .....

Firm's Address .....

.....

Telephone No. .....

Name of Competitor .....

Name of Firm .....

Firm's Address .....

.....

Telephone No. .....

The Society of Glass Technology

Papers at Birmingham Meeting

THE 42nd meeting of the Society of Glass Technology was held in Birmingham on March 16, when three papers were presented.

In his introductory remarks to a paper on the reaction between calcium carbonate and silica presented jointly with W. Maskill and G. H. Whiting, Professor W. E. S. Turner referred to the work reported in an earlier paper, dealing with the reaction between sodium carbonate and silica. The aim of the present work had been to investigate the reaction between calcium carbonate and silica of definite, small grain size, at various temperatures, the substances used being pure, in the form of calcite and crushed rock crystal. It was found that, at 700°, the decomposition of calcium carbonate was accelerated by the addition of silica, the acceleration increasing when the proportion of silica was increased from one to three molecules per molecule of calcium carbonate. At 750°, and 800°, however, the addition of silica in the proportion of SiO_2 : $CaCO_3$, produced very little change, although, as the silica content of the mixtures was increased, acceleration took place. Analysis showed that very little reaction had taken place between the carbonate and silica at these temperatures. From the results obtained it was obvious that this acceleration was not not due to increased chemical activity, but to a physical effect. The silica diluted the calcium carbonate, allowing of a quicker diffusion of carbon dioxide, and hence aiding the decomposition. At 800°, a 4 per cent. reaction occurred between the silica and the carbonate; the value at 1,050° was 10 per cent.; while the reaction was almost complete at 1,400°-1,450°.

Effects Induced by Furnace Gases

In a communication from the staff of the Research Laboratories of the General Electric Co., Ltd., Wembley, Dr. J. H. Partridge described how the surface of a commercial lead oxide glass (30 per cent. PbO; 56 per cent. SiO_2) soon lost the mirror-like appearance when exposed to the atmosphere existing in an oil-fired tank furnace at 1,200°. In two or three weeks' time the glass became cordy and lumpy, and the surface was dull, with small lumps of a white substance sometimes present. The white deposit was found to be mainly cristobalite. The application of heat alone at the temperatures concerned did not cause this precipitation, and the only gas which had any visible effect on the glass was sulphur dioxide. At a temperature of 1,200° in special experiments, this gas caused separation of silica on the glass surface, identical in crystalline form with that obtained in the tank, but in the presence of oxygen, a complex mixture of the sulphates of the alkalies and lead separated out with the silica. The atmosphere from burning fuel oil containing 1.7 per cent. sulphur also gave this result, which, however, was less marked when paraffin with only 0.04 per cent. of sulphur was used instead of the fuel oil.

Corrosion of Glass Melting Pots

Volatilisation from potash lead oxide glasses and its bearing on the corrosion of glass melting pots was dealt with by E. Preston and Professor W. E. S. Turner. The influence of temperature and time upon the progress of volatilisation was shown in tabular and graphical form over a range of temperature 900° to 1,400°, and for times extending to 200 hours. It was shown that volatilisation of the volatile constituents of a glass took place in a manner similar to simple evaporation, the rate of volatilisation at any time being proportional to the partial pressure of the volatilising constituent of constituents. The bearing of the work upon the corrosion of glass house pots used for melting full crystal glass was also discussed. The results of tests upon the crown and jib of corroded pot samples showed that the slagged interior surface of these samples were rich in PbO and K_2O. Penetration of lead oxide and potash into the refractory took place to a slight extent. It was suggested that high temperature firing of the pot as a whole, provided the refractory was suitable, might offer a partial remedy by reducing porosity and increasing the resistance to the slagging action of the lead oxide and potash vapours.

From Week to Week

SCOTTISH OILS, LTD., Grangemouth, are to extend their plant at a cost of £3,000.

PRINCESS MARGARETE ANDRONIKOW, the first woman professor and best known woman chemist in Germany, has died at Hohenheim, near Stuttgart, aged 52.

BLACKWOOD, LTD., have closed down their bleach works at Barrhead. Their Scottish and Irish business is now to be carried on at Neilston and the English business at their Derbyshire works.

MR. NEWTON STAFFORD, of Stamford, has been presented with a gold medal by Imperial Chemical Industries, Ltd., for 41 years' service for Eldred and Co., of Stamford, a subsidiary company. Four years ago, Mr. Stafford was presented with a gold watch for 37 years' service.

AT A GENERAL MEETING of the members of the Royal Institution held on April 4, Sir Robert Robertson, treasurer and vice-president, in the chair, Mr. J. Y. Fletcher, Dr. F. H. Garner, Miss Caroline H. Haslett, Mr. G. T. Hoyes, Mr. Hugh Macnabb, Mr. A. W. C. Mellor, Mr. George Riddoch, and Mr. G. A. Sawyer were elected members.

SATISFACTORY REPORTS were presented at the annual meeting of the Chemists' and Druggists' Society of Ireland, held in Belfast last week, when Mr. F. Storey, president, remarked that he felt that in the course of time the Society would be linked up with the newly-formed Ulster Retail Drug Trade Association, but at present the committee were against such action being taken. Mr. Storey was elected president for the 13th successive year.

MR. H. J. GARTHWAITE, the chairman of the English and French Lautaro Nitrate Co.'s preferred shareholders' committee, has informed the press that Mr. Jorge Oscar Herrera, the former chairman of the Lautaro Nitrate Co., and Mr. Carlos Cavallero, representatives of the shareholders at the meeting in Chile, have left for New York to represent the Lautaro preferred shareholders at the conference of the Cosach bankers.

THE MARRIAGE TOOK PLACE on April 2 at Selly Oak, Birmingham, of Mr. George King, M.Sc., hon. secretary of the Birmingham and Midland Section of the Society of Chemical Industry, and Miss Margaret Jervis, B.Sc., of Wesley Hill, Selly Oak. Mr. King is chief chemist at the chemical works of Albright and Wilson, Ltd., Oldbury, and Miss Jervis was in charge of the technical library there. Both are graduates of the University of Birmingham.

STEWARTS AND LLOYDS, LTD., of Glasgow and Birmingham, have secured a large part of the contract for 1,200 miles of oil piping for the Iraq Petroleum Company. The necessary steel as well as the tubes will be manufactured in Stewarts and Lloyds ironworks. The contract, valued at more than £500,000, will engage a large number of men for more than a year, and was obtained despite European and American competition.

THE PRIME WARDEN of the Dyers' Company has announced that the Dyers' Company Gold Research Medal for the period 1930-31 has been awarded to Professor F. M. Rowe, D.Sc., F.I.C., head of the Colour Chemistry and Dyeing Department, Leeds University, for a series of three papers on the chemical and physical effects of kier boiling on insoluble azo colours on the fibre. This is the third occasion on which Dr. Rowe has received this medal.

IT IS REPORTED THAT A NEW COMPANY is to be formed to acquire the vinegar businesses of Sarsons, Ltd., and Champion and Slee, Ltd., controlled by Crosse and Blackwell, and Beaufoy Grimble and Co., and the Distillers Co. The new company, under which these vinegar businesses will be amalgamated, will be a private company, whose capital will be divided in 130,000, 7 per cent. cum. pref. shares, 240,000 ordinary, and 80,000 deferred, all of £1 each. As a result of the proposed amalgamation, the debenture stockholders in Crosse and Blackwell will surrender their existing security in Champion and Slee and Sarsons in exchange for shares in a much larger undertaking. The necessary meeting to sanction the modification of the trust deed will be held at 20 Soho Square, London, W.1., on April 11.

EDINBURGH CORPORATION TRANSPORT DEPARTMENT is experimenting with a view to using creosote oil manufactured at the Corporation Gasworks for fuelling their buses.

RECENT WILLS include:—Mr. John Murdoch, Claremont, Eastbourne, retired chemical exporter, £40,032 (net personalty £36,885).

THE EXTRACTION OF IODINE FROM WELL WATERS is reported to be making Italy independent of foreign sources of iodine. A plant to carry out the process is being erected near Parma. In the vicinity of Salsomaggiore there are seventeen iodine wells.

THE WISSEN WORKS, Berlin, belonging to the United Steel Works Co., of Dusseldorf, which is the biggest tinplate works on the Continent, has engaged several hundred more workers, due to large foreign orders which enable it to utilise up to 75 per cent. of its capacity. About 1,700 workers are at present employed.

ACCORDING TO INFORMATION FROM NEW YORK the meeting of representatives of the financial houses and others interested in the Chilean Nitrate Co (Cosach) is shrouded in mystery. All the participants wish to avoid publicity, fearing that it would bring outside pressure and thus interfere with a settlement of the problems.

MR. R. ARTHUR THOMAS, a member of the Advisory Committee for the Metalliferous Mining Industry, set up under Section 4 of the Mining Industry Act, 1920, has been appointed chairman of the committee in place of Mr. J. J. Burton, deceased, Major W. D. Barratt has been appointed a member of the Advisory Committee as a representative of owners of iron ore mines and quarries; Mr. E. J. Fox as a representative of the iron and steel industry; and Mr. E. Archer as secretary to the committee.

British Association of Chemists

Forthcoming Meetings

THE annual meeting of the Notts and Derby Section of the British Association of Chemists will be held on May 9 in Derby. Mr. A. W. Knapp will give an address on the organisation of the profession. An informal meal wil be arranged. Visitors are invited. Several committee members retire under the three-year rule and nominations for new members will be welcomed; these should be sent to the hon. secretary before April 18. B.A.C. members are invited to a meeting of the Society of Chemical Industry on April 21, at 7.30 p.m., at Derby Technical College, when Mr. J. A. Clements (of the Brown-Firth research laboratories) will give an address on "Recent improvements in non-corrosive steels for domestic and industrial uses," illustrated by lantern slides.

The annual meeting of the Scottish Section will be held on April 22, at 7.30 p.m., in the Central Halls, Bath Street, Glasgow.

The annual meeting of the Birmingham Section will be held at the Chamber of Commerce, New Street, Birmingham, at 7.30 p.m., on May 10.

The annual general meeting of the London Section will be held on May 6, at 7 p.m. This will be followed by a smoking concert at 8-15 p.m. and it is hoped members will make a special effort to attend with their friends.

Salters Institute of Industrial Chemistry

A LIMITED number of fellowships are being offered by the Salters' Institute of Industrial Chemistry to chemists of post-graduate standing. The object of the fellowships is to afford additional and special training preparatory to a career in industrial chemistry. The normal value of each fellowship is from £250 to £300. The Institute also offers a limited number of grants-in-aid to young men or women, not under seventeen years of age, employed in chemical works in or near London, who desire to extend their education for a career in chemical industry. Applications for the fellowships and grants-in-aid must be sent not later than May 1 to the Director, Salters' Institute, Salters' Hall, St. Swithin's Lane, London, E.C.4.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2. at 1s. each.

Abstracts of Accepted Specifications

363,687. AMMONIUM CHLORIDE. Imperial Chemical Industries, Ltd.

Ammonium chloride liquor is treated before crystallisation with lead monoxide or red lead to remove iron or aluminium impurities, and the clear liquor then separated.

363,936. BARIUM SULPHATE. Sachtleben A.-G. für Bergbau and Chemische Industrie, Homberg, Niederrhein, Germany.

Chemically precipitated barium sulphate is heated to 300°-1,000° C. in the presence of 0.1 per cent. of a fusion agent such as an alkali oxide, hydroxide carbonate, chloride, sulphide, or sulphate, or alkaline earth chloride or sulphide. The sintered mass is then chilled in water, and then ground for use as a pigment.

364,043. CRACKING HYDROCARBONS. British and Dominions Feralloy, Ltd., and J. W. Bampfylde, 40 Grosvenor Gardens, London.

Hydrocarbons are thermally treated in chambers containing surfaces of an iron alloy containing 10-16 per cent. of aluminium and which may contain up to 6 per cent. of chromium. These alloys are used in treating gaseous paraffins or olefines at 550°-1,250° C. to obtain aromatic hydrocarbons, also gaseous olefines at 350°-550° C. under elevated pressure to obtain liquid polymerisation products, and for cracking liquid hydrocarbons in liquid or vapour phase at 350°-650° C.

364,103. SULPHUR DIOXIDE AND SULPHURIC ACID. Bolgar Oil Processes, Ltd., and P. A. McKay, Finsbury Pavement House, London, and W. R. Ormandy, 18 Belsize Grove, Belsize Park, London.

The products obtained in the treatment of mineral oils, tars, etc., with sulphuric acid are heated with a heavy residual oil, and the sulphurous gases which are evolved in an irregular manner are passed to a storage vessel from which they are drawn off regularly as required for the manufacture of sulphuric acid. The heavy residual oil acts as a flux to keep the material fluid and prevents coking. The temperature is kept below 180° C. to minimise liberation of hydrogen sulphide.

364,112. TITANIUM OXIDE-CALCIUM SULPHATE PIGMENTS. Titanium Pigment Co., Inc., 60 John City, New York. From W. F. Washburn, 1 Sidney Street, and L. Aagaard, 5044 Dewey Avenue, St. Louis, Mo., U.S.A.

A solution of a titanium salt containing a suspension of calcium sulphate is heated and hydrolysed to precipitate the titanium oxide on the calcium sulphate. The calcium sulphate suspension is obtained by adding quick or slaked lime or calcium carbonate to concentrated sulphuric acid. The resulting composite pigment is free from iron.

364,106. DEHYDROGENATING HYDROCARBONS. J. Y. Johnson, London. From *I. G. Farbenindustrie,* Frankfort-on-Main.

Mixtures of gaseous hydrocarbons are dehydrogenated in stages at successively increased temperatures. Temperatures up to 1,000° C. are employed in those stages in which hydrocarbons having two or more carbon atoms are converted, and temperatures above 1,000° C. in stages in which mainly methane is converted. The process is applicable to cracking gases, natural gases, waste gases from destructive hydrogenation, and low temperature carbonisation gases. The treatment is effected in chambers containing coke, silicious substances, fireclay, or catalysts such as metal oxides. The products are removed at each stage, and the methane obtained at the last stage is catalytically treated in the presence of excess of steam, air, or oxygen without increase of temperature, so that the aromatic hydrocarbons are unchanged and the methane is converted to carbon monoxide and oxygen. Catalysts may be employed in the last reaction, such as nickel and nickel oxide activated with aluminium or magnesium oxide. Examples are given of the treatment of gas obtained by the destructive hydrogenation of coal to obtain unsaturated hydrocarbons, ethylene, aromatic hydrocarbons, hydrogen and carbon black; also a mixture obtained by the destructive hydrogenation of brown coal tar.

Specifications Accepted with Date of Application

369,216. Ethyl alcohol from ethylene, Production of. G. F. Horsley and Imperial Chemical Industries, Ltd. Dec. 15, 1930.

369,236. Dyes, Manufacture of. J. D. Kendall and Ilford, Ltd. Dec. 16, 1930.

369,238. Polymerized cyano-anthraquinone compounds, Manufacture of valuable derivatives of. I. G. Farbenindustrie. Aug. 28, 1930. Addition to 309,193.

369,240. Fertilisers, Manufacture of. Lonza Elektrizitätswerke und Chemische Fabriken A.G. Oct. 14, 1929.

369,259. Alumina, Production of. A. S. Burman. Nov. 11, 1929.

369,259. Azo-dyestuffs, Manufacture of. I. G. Farbenindustrie. Oct. 16, 1929.

369,268. Alumina from coal products, Recovery of. Electric Smelting and Aluminium Co. Dec. 26, 1929.

369,283. Acetic anhydride, Process for the manufacture of. R. E. Ellis (*C. F. Boehringer and Soehne Ges.*) Apr. 1, 1931.

369,296. Formic acid, Production of. A. L. Mond. (*I. G. Farbenindustrie.*) Dec. 24, 1930.

369,297. Vinyl ethers, Manufacture of. J.Y. Johnson. (*I. G. Farbenindustrie.*) Dec. 24, 1930.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Aktiebolaget Götaverken. Preheating apparatus. 9161. March 30.

Aktiebolaget Svenska Flaktfabriken. Drying plant. 9027. March 29. (Sweden, March 26, '31.)

Andrews, R. S., and Broadhead, C. F. Treatment of tars, etc. 9110. March 30. (Australia, July 2, '31.)

Bedford, C. S. Dispersing &c. agents. 8946. March 29.

Beldam, W. R. Filtering &c. apparatus. 9414. April 1.

Bozel-Maletra Soc. Industrielle de Produits Chimiques. Manufacture of pure carbonic acid. 9205. March 30. (France, May 28, '31.)

British Celanese, Ltd., Dreyfus, H., Fallows, L., and Oxley, H. F. Manufacture of aliphatic compounds. 9468. April 1.

Bryce, Ltd., and Sidney, A. A. Filtering liquids. 9287. March 31.

Carpmael, A. (*I. G. Farbenindustrie*). Manufacture of conversion products from resins, &c. 9202. March 30.

—— Manufacture of new condensation products from natural resins. 9322. March 31.

Dreyfus, H. Treatment of organic compounds. 9396. April 1.

Dupuy, H. Distillation of fuels. 9517. April 2. (France, April 3, '31).

Ermen, W. F. A., and Todd, W. Wetting agents. 9397. April 1.

Gassner, F. Impregnation of organic aggregates for plastic masses. 9288. March 31. (Germany, April 1, '31.)

Haslam, T. J. Mixing, &c., apparatus. 9532. April 2.

I. G. Farbenindustrie Akt.-Ges. Sensitizing silver-halide emulsion layers. 9050. March 29. (Germany, March 27, '31.)

—— Manufacture of a stable chloro rubber. 9201. March 30. (Germany, March 30, '31.)

Imperial Chemical Industries, Ltd. Detergent, &c., composition. 9208. March 30.

—— and Scholefield, F. Wetting agents. 9397. April 1.

Johnson, J. Y. (*I. G. Farbenindustrie.*) Manufacture of vat dyestuffs of anthraquinoneacridone series. 9030. March 29.

—— Manufacture of neutral peat fertilisers. 9416. April 1.

—— Carrying out fermentations. 9417. April 1.

—— Manufacture of azo-dyestuffs. 9418. April 1.

Levey, L. T. Manufacture of unsplinterable glass. 9319. March 31. (Union of South Africa, April 2, '31.)

Norsk Hydro-Elektrisk Kvaelstofaktieselskab. Manufacture of nitrate of lime in globular form. 9039. March 29. (Germany, Feb. 22.)

North British Chemical Co., Ltd. Application of coating to wood, &c. 9100. March 30.

Otto & Co. Ges., Dr. C. Removal of sulphur from gases. 9451. April 1. (Germany, April 15, '31.)

Pemberton, R. T., and United Water Softeners, Ltd. Base exchange water softening apparatus. 9430. April 1.

Roughton, F. J. W. Preparation of a catalyst. 9464. April 1.

Sec. of Chemical Industry in Basle. Obtaining fast tints on wool. 9296. March 31. (Switzerland, April 2, '31.)

Titanium Pigment Co., Inc. Pigments and paints. 9054. March 29. (United States, April 9, '31.)

Townsend, W. W. Disposal of ammoniacal liquor. 9080. March 30.

Worwood, H. E. Evaporators. 9263. March 31.

Kelp and Carrageen in Ireland

Industries being Fostered by Free State Department

IN the course of an article on industries in the Gaeltacht (Irish speaking) districts the *Irish Trade Journal*, which is the official publication of the Free State Department of Industry and Commerce, states that on the western seaboard of Ireland the collection and burning of seaweed for the making of kelp shrunk to small dimensions owing to lack of organisation. Prices were uncertain and maintained at a low level by lack of competition among buyers and this reacted on the quality of the kelp. In order to revive the industry a co-operative scheme was initiated under which the Free State Department of Lands and Fisheries acts as an intermediary between the burner and the purchaser of kelp. A field test is made of every batch of kelp brought in and the price paid to the kelp-maker is governed by the iodine content of his product. He has thus an incentive to use only weeds with a high iodine content and to burn the kelp in a manner calculated to secure the best results. Although weather conditions in 1930 were poor the output of kelp was increased by 40 per cent. and the total sum realised by 80 per cent. In 1931 the weather was still worse but the higher output of kelp in the previous year was maintained and the price increased by over 10s. per ton. It is considered that the industry is capable of expansion to a total annual value of £150,000.

Carrageen (Irish moss), which has a high gelatine content, is gathered during May to September. It may be used for a wide variety of industrial purposes and appropriate markets are being explored by the Department of Lands and Fisheries. In consequence, the value of carrageen to the gatherers has, within a very short period, been greatly advanced, in some places from £8 to £20 per ton. It is proposed to extend the sale of this product to Great Britain and America

The United Molasses Company

Deficit due to Adverse Circumstances

THE United Molasses Co. reports a small trading profit for 1931 of £61,232, which, however, is turned into a deficit of £600,812 by certain heavy charges, many of them of a non-recurring nature, the heaviest being £433,393, the cost of molasses which had to be run to waste. To this deficit has to be added £110,601 in respect of capital losses incurred during the year, mainly arising out of the sale of the 50 per cent. interest in Eastern Alcohol Corporation. The debit is thus increased to £711,413, which makes a total adverse balance carried to the current year's accounts of £775,673. It is pointed out by the directors that the decline in the consumption of molasses in all parts of the world continued until late in the year and the deliveries fell from about 1,900,000 tons in 1929 to 1,100,000 tons in 1931. This severe set-back necessitated the destruction at the point of production of large quantities of molasses for which storage was not available.

It was during the last quarter of 1931 that the long-continued decline in the consumption of molasses in Great Britain and some of the Continental markets came to an end. Since then there has been a steady and continuous improvement in those markets and the deliveries during January-February of this year exceeded those of last year by about 50 per cent. This improvement and the necessity of replenishing stocks have made it possible during the winter to find employment for the company's fleet of Diesel tankers. In America and India the decline in consumption has not run its course and the falling-off in the deliveries in those markets during the first two months of this year more than offset the improvement in Europe. The quantity of molasses available for consumption this year will probably be at least 750,000 tons less than last year, and if it had not been for the continued decrease in American consumption about which the directors do not speak hopefully, a healthy equilibrium between supply and demand would have been assured.

Bromine in France

FRANCE consumes annually some 200 metric tons of bromine. Formerly the French production of bromine amounted to about 120 tons extracted from the waters of the Berre pool near Marseilles. However, since 1926, the Kali-Sainte-Therese and the State potash mines have been able to obtain about 450 metric tons annually

Points from Manufacturers' Literature

The Editor welcomes copies of new brochures and leaflets describing plant, equipment and products of interest to chemical manufacturers and the chemical using trades.

DRYING STOVES are illustrated and described in a leaflet received from L. A. Mitchell, Ltd., of 37 Peter Street, Manchester. These "Mitchell" drying stoves are suitable for dealing with any chemical product, colour or pigment that can be handled on trays or shelves. They operate on a system of re-circulation of the heated air, thus utilising the heat to the fullest extent before being exhausted to waste. By re-circulating the air, the heat it loses in taking up moisture when passing over the material, is regained when passing through the heater. The constantly re-heated air is thereby enabled to take up more and more moisture and is not exhausted from the dryer until the point of saturation is almost reached. The system of circulation thus operates continuously so that a small amount of fresh air is drawn in and a portion of the air just before becoming saturated is exhausted to waste. Compared with vacuum stoves the "Mitchell" stoves claim to give 40 to 50 per cent. reduction in drying cost and also a more uniformly dryed and purer product (at a lower first cost), with less maintenance on upkeep and repairs. Compared with atmospheric dry rooms and stoves they will usually dry in one-quarter to one-third of the time, with a large saving in fuel and floor space, less handling and a more uniform dried product. Built on the unit system, they enable the user to install a trial unit before committing himself to a large expenditure for the installation of a new drying plant, or to replace any existing dryer. It is also interesting to note that they can be operated on half output without loss of efficiency or increased fuel consumption per lb. of dried material.

* * *

THE DEMAND FOR AN EFFICIENT METALLIC FILTER to replace the usual fabric, gauze or perforated metal type, has resulted in the production of the Purolator metal element filter, which is described in a leaflet issued by the Automotive Products Co., of Brock House, Langham Street, London, W.1. This filter has been constructed to withstand pressures without damage or loss of efficiency. The high degree of filtration demanded by modern equipment and processes calls for a very fine mesh where wire gauze is used on the filter element, and the limitation of such filtering material is the fragility of the wire itself, which renders the element liable to fracture when used even under the lowest pressures. Where perforated metal is used as the filtering element, the degree of filtration, however, is limited by the many difficulties met with in producing perforations of less diameter than 0.02 in., which is too coarse for many filtration applications. This difficulty is overcome in the Purolator metal element, which is constructed by winding a special metallic ribbon on a former of determined dimensions, edgewise, the ribbon being of tapered cross section and provided at certain intervals with projections of uniform height. The height of these projections determine the degree of filtration which takes place and can be made as small as 0.0005 in., thus preventing the passage of particles as minute as half of one thousandth of an inch. The front edge of the filter presented to the dirty oil or other fluids to be cleaned is not flat, but curved outwardly, so that back flow for cleaning drives the entire cake off the surface of the filter instead of leaving portions still attached. The effect of the tapered cross section of the ribbon renders it impossible for wedging to take place behind the edge; wedging with its consequent tendency to clog the filter makes cleaning by back pressure difficult. Filters embodying the new element are made in a comprehensive range and will be found of use in chemical works, sugar refineries, breweries, preserving factories and dye works, as well as for the filtration of fuel oil, lubricating oil and similar liquids.

New French Potassium Sulphate Plant

THE plant for the production of potassium sulphate, installed at Grand-Couronne, near Rouen, by the Société Potasse et Engrais Chimiques (created by the Potasses d'Alsace and the Kali-Sainte-Therese companies), is now in full operation. Hydrochloric acid, obtained as a by-product, is used in the decomposition of natural phosphate into soluble phosphates with a content of from 38 to 42 per cent. phosphoric acid.

Weekly Prices of British Chemical Products

The following notes on the chemical market conditions in Great Britain are based on direct information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE *by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market by Chas. Tennant and Co., Ltd.*

THERE has been a slight broadening in the demand for chemical products, with more interest being shown in a number of imported materials. Prices continue steady, there having been less fluctuations during the past week than previously. There is little change to report in the coal-tar products market in London, although the demand for benzol and naphtha has improved. Prices, however, are unchanged. Conditions on the Manchester chemical market during the past week have been patchy, but in several instances business is reported to have displayed some degree of improvement, with buying interest certainly on a better scale than it was a week ago after the holiday break. Prices of the majority of products continue to show a decidedly steady front, but here and there a certain amount of reaction, due primarily to the rise in the value of the pound, has been in evidence. In Scotland, business has been exceptionally quiet during the past week.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 40%, £19 15s. per ton d/d address U.K. in casks. LONDON: Tech. 80%, £37 5s.; pure 80%, £38 5s.; 60% £28 10s.; tech. 40%, £19 15s. SCOTLAND: Glacial 98/100%, £48 to £50; pure 80%, £38 5s.; technical 80%, £37 5s. d/d buyers' premises Great Britain. MANCHESTER: 80% commercial, £39; tech. glacial, £52.

ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in one-ton lots upwards.

ACID, CHROMIC.—11d. per lb., less 2½% d/d U.K.

ACID, CITRIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 2d., less 5%. MANCHESTER: 1s. 1½d. to 1s. 2d.

ACID, CRESYLIC.—*97/99%, 1s. 7d. to 1s. 9d. per gal.; 99/100%, 1s. 10d. to 2s.

ACID, FORMIC.—LONDON: £50 to £51 per ton. *£52.

ACID, HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech.. 50% by vol., £23 10s. per ton; 50% by weight, £27 10s.; pale tech., 50% by vol., £27; 50% by weight, £32; 80% by weight, £52; edible, 50% by vol., £40. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £20 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £50 per ton in casks, £51 10s. in kegs, *£52 in casks d/d. SCOTLAND: 98/100%, £50 to £53 ex store. MANCHESTER: £2 10s. per cwt., ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations: 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 1½d., less 5%. SCOTLAND: B.P. crystals, 1s. 1¾d. to 1s. 2d. less 5% carriage paid. MANCHESTER: 1s. 1½d.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON: £8 15s. to £9 10s. per ton according to quality and quantity. *£8 10s. SCOTLAND: £8 to £8 10s. ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb. d/d, according to quantity.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £36 per ton; powdered, £38, packed in 5-cwt. casks d/d U.K. stations or f.o.b. U.K. ports.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton, carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

ANTIMONY OXIDE.—SCOTLAND: Spot £27 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 4d. to 1s. 6d. per lb. according to quality.

ARSENIC.—LONDON: £24 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £26 10s. f.o.r. mines. SCOTLAND: White powdered £27 ex wharf; spot, £27 10s. ex store. MANCHESTER: White powdered Cornish, £27 at mines.

ARSENIC SULPHIDE.—Yellow 1s. 6d. to 1s. 8d. per lb.

BARIUM CHLORIDE.—LONDON: £11 10s. per ton. SCOTLAND: £11 5s. in casks, ex store.

BISULPHIDE OF LIME.—£7 10s. per ton f.o.r. London, packages free.

BLEACHING POWDER.—Spot 35/37% £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated £15 10s. per ton, powder £17, packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—3s. 6d. to 3s. 9d. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot £5 5s. to £5 15s. per ton d/d station in drums. SCOTLAND: £5 5s. to £5 15s., according to quantity and point of delivery.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—4½d. to 5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £55 per ton, drums extra.

CHROMIUM OXIDE.—10d. to 10½d. per lb. according to quantity d/d U.K. Green 1s. 2d. per lb.

CHROMETAN.—Crystals 3¾d. per lb. Liquor £19 10s. per ton d/d U.K.

COPPERAS GREEN.—SCOTLAND: £3 15s. per ton, f.o.r., or ex works.

CREAM OF TARTAR.—LONDON: £5 3s. per cwt.

FORMALDEHYDE.—LONDON: 28s. 6d. to 29s. 6d. per cwt. *30s. SCOTLAND: 40%, £28 per ton ex store.

HYDROGEN PEROXIDE.—LONDON: *100 vols. 10d. per lb.

LAMPBLACK.—£46 to £50 per ton.

LEAD ACETATE.—LONDON: White £42 to £44 per ton. Brown £1 per ton less. *£43 and £42 respectively ex wharf London. SCOTLAND: White Crystals £42 to £44 c.i.f. U.K. ports. Brown £1 per ton less. MANCHESTER: White, £39; Brown, £36 10s.

LEAD, NITRATE.—LONDON: £28 10s. to £29 per ton; MANCHESTER: £29.

LEAD, RED.—SCOTLAND: £28 10s. per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £40 per ton carriage paid.

LITHOPONE.—30%, £20 to £22 per ton.

MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial quality 64 O.P., 1s. 8d. to 2s. 3d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

NICKEL SULPHATE.—£38 per ton d/d.

PHENOL.—LONDON: *5½d. to 6¼d. per lb.

POTASH CAUSTIC.—£30 to £33 per ton. LONDON and MANCHESTER: £40 to £42.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quality. Ground, 5¾d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports with allowance for contracts. MANCHESTER: 5d.

POTASSIUM CARBONATE.—SCOTLAND: 96/98% spot £28 per ton ex store. LONDON: £32 to £33 10s. MANCHESTER: £30.

POTASSIUM CHLORATE.—3¾d. per lb. export London in 1-cwt. kegs. LONDON: £37 per ton. SCOTLAND: 99½/100% powder, £34. MANCHESTER: £35.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £28 per ton c.i.f U.K. ports. Spot £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: B.P. crystals, 8½d. MANCHESTER: Commercial, 8d.; B.P., 8½d.

POTASSIUM PRUSSIATE.—LONDON: 8½d. to 1s. 10d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d address in barrels.

SODA ASH.—58% spot, £6 per ton f.o.r. in bags, special terms for contracts.

SODA, CAUSTIC.—Solid 76/77° spot £14 10s. per ton d/d station. SCOTLAND: Powdered 98/99% £17 10s. in drums, £18 15s. in casks. Solid 76/77% £14 10s. in drums. 70/72% £14 12s. 6d. carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £12 15s. to £14 contracts.

SODA CRYSTALS.—Spot £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—97/98%, £21 per ton; LONDON: £21 10s. to £22.

SODIUM BICARBONATE.—Refined spot £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

* Prices quoted by other manufacturers.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous 5d. per lb. LONDON: 4d. per lb. with usual discounts for contracts. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.
SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.
SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.
SODIUM CHLORATE.—2¾d. per lb. LONDON: £30 to £32 per ton. MANCHESTER: £31.
SODIUM CHROMATE.—3⅝d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals £15 ex station 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15 to £15 10s.
SODIUM NITRITE.—Spot £19 to £22 per ton d/d station in drums.
SODIUM PERBORATE.—LONDON: *10d. per lb.
SODIUM PHOSPHATE.—£13 to £15 per ton f.o.r. London casks free. LONDON: Dibasic, £13 per ton. MANCHESTER: £13 10s.
SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 5d. to 6d.
SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.
SODIUM SULPHATE (SALT CAKE).—Unground Spot £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d.
SODIUM SULPHIDE.—Solid 60/62% Spot £10 15s. per ton d/d in drums. Crystals Spot £7 15s. per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11 10s.; commercial, £8.
SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot £9 10s. d/d station in bags.
SULPHATE OF COPPER.—MANCHESTER: £18 to £18 10s. per ton f.o.b.
SULPHUR.—£12 5s. to £15 15s. per ton. SCOTLAND: Flowers, £12 10s.; roll, £12 10s.; rock, £9. Ground American, £12 ex store.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.
SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.
VERMILION.—Pale or deep, 6s. 4d. per lb.
ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.
ZINC SULPHATE.—LONDON and SCOTLAND: £12 per ton.
ZINC SULPHIDE.—1s. to 1s. 2d. per lb.

Pharmaceutical and Photographic Chemicals

THE following changes are reported in the prices of pharmaceutical and photographic chemicals:—
COCAINE, HYDROCHLORIDE.—28s. 11d. per oz.
IODOFORM, B.P., CRYST., PRECIP., or POWDER.—22s. 6d. to 23s. 9d. per lb.
IODINE, RESUB., B.P.—19s. 7d. to 20s. 10d. per lb.
POTASS. IODIDE, B.P.—16s. 10d. to 19s. 10d. per lb.
SODIUM IODIDE, B.P.—18s. 3d. to 19s. 3d. per lb.
QUININE ALKALOID.—3s. 1d. per oz.
QUININE, HYDROCHLORIDE.—2s. 10d. per oz.
QUININE, SALICYLATE.—2s. 11d. per oz.
QUININE, SULPHATE.—2s. 3d. per oz.
QUININE, SULPHATE, ACID.—2s. 3d. per oz.
SOD. POTASS. TARTARIC (ROCHELLE SALT).—85s. per cwt.

Coal Tar Products

ACID, CARBOLIC (CRYSTALS).—5½d. to 6½d. per lb. Crude, 60's 1s. 5¾d. to 1s. 6¾d. per gal. SCOTLAND: Sixties, 1s. 7d. to 1s. 8d.
ACID, CRESYLIC.—99/100, 1s. 7d. to 1s. 8d. per gal.; B.P., 2s. to 2s. 3d.; Refined, 1s. 10d. to 2s.; Pale, 98%, 1s. 7d. to 1s. 8d.; Dark, 1s. 4d. to 1s. 4½d. LONDON: 98/100%, 1s. 6d. Dark 95/97%, 1s. 4d. SCOTLAND: Pale 99/100%, 1s. 3½d. to 1s. 4½d.; 97/99%, 1s. 1½d. to 1s. 2½d.; dark 97/99%, 1s. 0½d. to 1s. 1½d.; high boiling acid, 2s. 6d. to 3s.
BENZOL.—At works crude 7d. to 7½d. per gal. Standard motor, 1s. 2d. to 1s. 3d.; 90%, 1s. 3d. to 1s. 4d. Pure, 1s. 6d. to 1s. 7d. LONDON: Motor, 1s. 5½d. SCOTLAND: Motor, 1s. 3½d. to 1s. 4½d.; 90%, 1s. 9½d. to 1s. 10½d.
CREOSOTE.—Standard for export, 4¾d. to 5d. nett per gal. f.o.b. for Home, 3¾d. d/d. LONDON: 3d. to 3½d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 4d. to 4¾d. SCOTLAND: Specification oils, 3⅞d. to 4¼d.; washed oil, 4d. to 4½d.; light, 4d. to 4½d.; heavy, 4½d. to 5d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. to 1s. 4d. per gal.; 95/160, 1s. 4d. to 1s. 6d.; 90/190, 11d. to 1s. 2d. LONDON: Solvent, 1s. 1½d. to 1s. 2d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160, 1s. 3d. to 1s. 3½d.; 90/190, 1s. 1d. to 1s. 2d.
NAPHTHALENE.—Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 65s. to 70s.
PYRIDINE.—90/140, 3s. 9d. per gal.; 90/160, 4s. to 4s. 6d.; 90/180, 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 3s. to 4s.
REFINED COAL TAR.—SCOTLAND: 5d. to 5½d. per gal.
TOLUOL.—90%, 2s. 6d. per gal.; Pure, 2s. 9d.
XYLOL.—1s. 10d. per gal.; Pure, 2s. 1d.

Intermediates and Dyes

IN the following list of Intermediates delivered prices include packages except where otherwise stated:—
ACID, BENZOIC, B.P. (ex Toluol).—1s. 9½d. per lb.
ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.
ACID, SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.
BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL.—34.5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 2d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—8½d. per lb.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 9d. per lb.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
B-NAPHTHOL.—Spot, £75 per ton in 1-ton lots, d/d buyer's works.
α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 10d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb.; 5-cwt. lots, drums extra.
NITRONAPHTHALENE.—9d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.
o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 9d. per lb., d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 6d. per lb., 100%.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—The market remains unchanged at about £5 5s. per ton f.o.b. U.K. port in single bags. There is no shortage of supplies. *Home.*—The home demand continues brisk although a slight tendency to decrease can now be detected. The price remains unchanged at £7 per ton, delivered in 6-ton lots to consumers' nearest station.
NITRATE OF SODA.—There is nothing further to report.
NITRO-CHALK.—The demand is good and the price remains at £7 5s. per ton, delivered to farmers' nearest station.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. per ton. Grey, £12. Liquor, 8d. to 9d. per gal. MANCHESTER: Brown, £7 5s.; grey, £11.
ACETIC ACID, TECHNICAL, 40%.—£16 15s. to £17 15s. per ton.
ACETONE.—£63 to £65 per ton.
AMYL ACETATE, TECHNICAL.—95s. to 100s. per cwt.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gal.
WOOD CREOSOTE.—1s. to 2s. 6d. per gal., unrefined.
WOOD NAPHTHA, MISCIBLE.—3s. to 4s. per gal. Solvent, 3s. 9d. to 4s. 9d. per gal.
WOOD TAR.—£2 10s. to £6 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Latest Oil Prices

LONDON, April 6.—LINSEED OIL was easy. Spot, ex mill, £15 15s.; April, £13; May-August, £13 17s. 6d.; September-December, £15 per ton, naked. RAPE OIL was inactive. Crude extracted, £30; technical refined, £32 per ton, naked, ex wharf. COTTON OIL was neglected. Egyptian crude, £21 10s.; refined common edible, £26; and deodorised, £28 per ton, naked, ex mill. TURPENTINE was quiet. American, spot, 58s.; May-June, 56s. 9d. per cwt.
HULL.—LINSEED OIL, spot and April closed at £12 15s.; May-August at £13 12s. 6d.; September-December at £14 12s. 6d. COTTON OIL, Egyptian, crude, spot, £21; edible, refined, spot, £23 15s.; technical, spot, £23 15s.; deodorised, £25 15s. PALM KERNEL OIL, crude, f.m.q., spot, £22 10s. naked. GROUNDNUT OIL, crushed/extracted, spot, £33 10s.; deodorised, £37 10s. RAPE OIL, crushed/extracted, spot, £28 10s.; refined, £30 10s. SOYA OIL, crushed/extracted, spot, £20 10s.; deodorised, £24 per ton. COD OIL, nominal. CASTOR OIL, pharmacy, spot, 45s. 6d.; first, 40s. 6d.; second, 35s. 6d. per cwt. TURPENTINE, American, spot, not quoted.

* Prices quoted by other manufacturers.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

SHARP, Harold, Foxdown Villa, Wellington, Somerset, dyers' manager. (C.C., 9/4/32.) (£12 15s.) March 1, 1932.

WILDE, Ralphe and Co., Cranbrook Dye Works, Nunhead Grove, London, S.E., dyers. (C.C., 9/4/32.) (£23 3s. 5d.) February 19, 1932.

Bill of Sale

BAXTER, Arthur Jas., 34 Hall Road, Stratford, varnish chemist. Dated March 24, filed March 30. (£60.)

London Gazette, &c.

Order Made on Application for Discharge

HEYL, George Edward, 96 Grosvenor House, Park Lane, London. Consulting chemical engineer, lately carrying on business at 36-38 Victoria Street, Westminster, London. (O.M.A.D., 3/3/32.) Discharge suspended for three months, until June 3.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

175. (*Chalk Clay*).—A correspondent in Peru sends us a sample of chalk clay, which, he states, is now used in the United States with good results in the manufacture of Roman cement. It is also used for cold storage, as it maintains a low temperature for many hours. As it retains heat, it is also used for foundry purposes. He possesses a deposit of the material containing over 10,000,000 tons, of which large shipments could be sent monthly to Great Britan. He wishes to know whether this substance is used by sugar refiners in this country. Further particulars from the Editor.

Company News

MAJOR AND CO.—The directors do not see their way to pay any dividends on preference shares. (Paid to March 31, 1931.)

PORT SAID SALT ASSOCIATION.—Dividend of 2s. 6d. per 10s. share for the year, being 25 per cent. (against 40 per cent. for 1930).

CANADIAN INDUSTRIES.—Dividend of 1¾ per cent. on 7 per cent. cumulative preferred stock for quarter ending March 31, 1932, payable April 15.

AMERICAN COMMERCIAL ALCOHOL.—Report for 1931 shows a loss of $597,651 after charges and depreciation. Against reserves of $1,098,201 there has been charged $711,115 reduction in inventory values, amortisation and other items.

RECKITT AND SONS, LTD.—The directors recommend a final dividend of 6½ per cent., together with a bonus of 1¼ per cent., on the ordinary shares, making a total payment of 22½ per cent. for the year, the same as in 1930. The annual meeting will be held April 29.

JOSEPH CROSFIELD AND SONS, LTD.—Profit for the year ended December 31, 1931, amounted to £680,072, comparing with £598,458 for the 13 months ended December 31, 1930. An ordinary dividend of 30 per cent., less tax, is recommended, against 15 per cent. for previous period. There remains £54,365 to be carried forward.

BRITON FERRY CHEMICAL AND MANURE.—After charging £2,713 in respect of depreciation and transferring £2,738 from income-tax provision account, and crediting balance brought forward there remains adverse balance of £7,488. The directors have transferred a similar amount from reserve account to extinguish this debit.

WILLIAM BLYTHE.—Net profit for 1931 was £23,233 (against £25,834). There has been reserved for taxation £2,166 (£4,380), and transferred to depreciation reserve £4,115 (£1,963), leaving £16,952. The directors recommend a final dividend on ordinary shares at the rate of 5 per cent. (subject to tax), making 7 per cent. for the year (8 per cent.), leaving balance to be carried forward of £5,995 (£6,146).

ALEXANDER DUCKHAM AND CO.—The report for the year 1931 shows gross profit of £99,907 (against £87,903), from which is deducted sales and management expenses, etc., £87,175, directors' fees £1,100, leaving a net profit of £11,632. To this is added the balance brought in £8,140, making £19,772. Income tax absorbs £1,823, interim dividend £2,406, written off goodwill £5,000, leaving £10,543. An interim dividend of 3 per cent. was paid on October 2, 1931, and the board recommend a final dividend of 7 per cent.

AMERICAN CYANAMID.—The net operating profit, before depletion and depreciation, for 18 months ended December 31, 1931, was $4,338,810 (against $7,513,517 for the twelve months to June 30, 1930). Adding dividends, interest and discounts $523,801 ($719,642), royalties, licences, and service charges $286,185 ($355,340), and other earnings (net) $288,168 ($254,633), there is a total of $5,436,965 ($8,843,133). After making deductions for depreciation, research, process, and market development expense, interest charges, income-tax, and minority stockholders' interest in net income of subsidiaries, the net income is $520,803 ($4,618,099).

MORGAN CRUCIBLE CO.—For the year 1931 the accounts show a trading profit, after depreciation of £145,988, against £267,717 in the previous year, plus U.S.A. Customs duties refunded and provision therefore not required £65,224, interest on investments, etc., £35,749, and £561 brought in, making a total of £247,522. To directors' fees is placed £3,000, interest on employees' loan obligations £2,748, preference and preferred dividends £41,625, interest on 7 per cent. obligations £13,063, interim dividend on deferred £30,634, to income tax £47,869, to capitalisation of 7 per cent. obligations £67,437, final deferred dividend 6d. per share £40,462, leaving to be carried forward £633.

Chemical Trade Inquiries

Abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

CANADA.—A firm in Montreal dealing in soap and chemicals for laundries, tanners, soap manufacturers, etc., desires to obtain United Kingdom agencies for the sale of bleaching powder, calcium chloride, trisodium phosphate, oxalic acid, borax and alum, in the province of Quebec and in part of the Provinces of Ontario and New Brunswick. (Ref. No. 606.)

MEXICO.—A commission agent in Mexico City desires to secure the representation of United Kingdom firms for the sale of caustic soda, bicarbonate of soda, glucose, trunk hardware, raw rubber, red lead and whiting. (Ref. No. 643.)

New Company Registered

I.C.I. (EXPLOSIVES), LTD., Imperial Chemical House, Millbank, S.W.1. Registered April 4. Nominal capital £4,992,900 in £1 shares. To acquire and hold not less than 90 per cent. in the case of shares and the whole or any portion of the debentures, debenture stock and other interests in Nobel's Explosives Co., Ltd., Curtis's and Harvey, Ltd., Bickford Smith and Co., Ltd., W. H. Wakefield and Co., Ltd., Alexander Walker and Co., Ltd., the Sedgwick Gunpowder Co., Ltd., the Liverpool Magazines Co., Ltd., British Westfalite, Ltd., R. and T. Jack and Co., Ltd., the Patent Electric Shot Firing Co., Ltd., Roburite and Ammonal, Ltd., and the Lancashire Explosives Co., Ltd., to adopt an agreement dated February 25, 1932, with Imperial Chemical Industries, Ltd., and to carry on the business of manufacturers of and dealers in explosives and ammunition, etc., glycerine, oil, fats, sulphate of ammonia and other artificial manures, celluloid, artificial silk, dyestuffs and hydrogen or other gas, iron and coal masters, miners, founders, etc. Subscribers: C. V. Allen and P. J. Cory, both of Imperial Chemical House, Millbank, S.W.1.